

B  
Lxg/2  
CLL



THE PENNIMAN MEMORIAL LIBRARY OF EDUCATION  
OF YALE UNIVERSITY  
ESTABLISHED BY JAMES HOSMER PENNIMAN, YAL  
IN MEMORY OF HIS PARENTS  
JAMES LANMAN PENNIMAN, YALE 181  
MARIA DAVIS HOSMER

27  
9  
151  
20  
30

$\begin{array}{r} 26 \\ 264 \\ 264 \\ 264 \end{array}$

11<sup>th</sup> Dec. 1897

0-50  
r-50

17405

83

十

35



Handwritten signature: *Handwritten signature*



Edw Paine

~~A/S~~

Thomas

Paine

1879

1879

1879

# ARITHMETICAL QUESTIONS,

OR

A Plain and Familiar way to  
Common ARITHMETICK.

CONTAINING

The most Necessary and Fundamental  
Rules of the said ART : Digested into a very  
easie Method.

Set forth for the help and advantage  
of those that desire to attain the knowledge  
of that ART.

BY

JOHN LE DUKE,

French School-Master in Colchester.

*The First Part.*

London, Printed by Da. Maxwell, and are to be  
sold by Sa. Collibrand at the Ball in St. Pauls  
Church-yard, London ; and by  
William Hall, Bookfeller in  
Colchester. 1668.

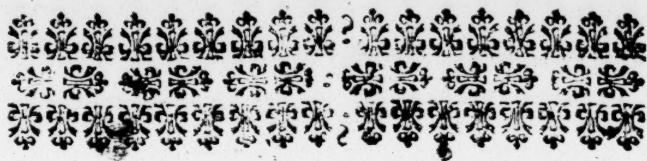
W. Hall  
1679

QUESTIONS

10

10

10



To the Right Worshipful  
*Thomas Rennolds* Esquire,  
Major of *Colchester* ;  
Sir *John Shaw* Knight, Recorder,  
and the Worshipful Aldermen,  
together with the Assistsants  
and Common Council of the  
said Town.

Worthy Gentlemen,



Or me to enter into a  
large description of  
the Excellency of the  
Art of Arithme-  
tick, were to rob  
you of too much of  
your pretious time, and consequently,  
detain you too long from your more

A 2

weighty

*John Shaw*

## The Epistle Dedicatory.

weighty Employments, and to undertake a task too high and too hard for my feeble Pen. It shall therefore suffice at present to say, that amongst the Seven Liberal Arts, Arithmetick is none of the least; it is a Science in it self, so noble and of such general use, that no Nation can in a flourishing condition, subsist without it. The blessing of the Almighty upon my endeavors, having rendred me a poor Proficient therein, I would not willingly be found an unprofitable Servant, hiding this my Lords Talent in a Napkin; knowing that where he gives Power, he expects Improvement. I have therefore for the benefit of others (no man being born solely for himself) especially those committed to my care, employed some spare minutes in Penning the ensuing Treatise, containing in it the Fundamentals of the forementioned Art, and have assumed the liberty to Dedicate



## The Epistle Dedicatory.

it to your *Worships* ; not as a thing worthy of your *Acceptance* or *Patronage*, but as a real *Pledge* of the *Honor* and *Respect* I bear you ; a token of my ready and chearful *submission* to your *Authority*, and *Testimony* of my willingness to serve you in all things within the compass of my *Capacity*. It was an excellent saying of *Pittacus* the *Philosopher*, That he would have no man undertake to *Govern*, till he had first learned to forgive. I question not in the least, but that you (*Worthy Sirs*) are all good *Proficients* in that his *Lesson*, and shall therefore hope to obtain with the more facility, your pardon for my presumption in dedicating these my weak *Labors* to you.

Gentlemen, That God who hath made you *Governors*, would bless you all with a spirit of *Wisdom* and *Government*, to carry on your work so here, that at



## The Epistle Dedicatory.

*the Judgment of the great day, you may  
be able and ready to render unto him a  
comfortable account of those Talents  
wherewith he did intrust you, and re-  
ceive from him for reward, that blessed  
sentence of, Well done good and  
faithful Servants, enter into the  
joy of your Lord, shall be the daily  
Supplications of*

Your Worships Faithful  
and humble Servant

*John Le Duke.*

---

To

To my singular and approved  
Good Friend *John Furly* Senior, Gent.  
late Alderman in Colchester.

Worthy Sir,



*My* days are all numbred by the  
Almighty, and the sum there-  
of kept from us as a Secret in  
the Cabinet of his Privy  
Council; not knowing there-  
fore how soon your, or my Glas  
may be run, and Light extinguished, should I  
not interest you in the first-fruits of my Labors  
in these Parts sent abroad into the World, In-  
gratitude would seem legible in every Leaf  
thereof, to the Inhabitants of this Town; it  
being sufficiently known, that Mr. Stephen  
Furly, your Son, was the first Instrument  
(under God, who orders all our steps) in bring-  
ing me hither; being here, your Self and your  
Authority at that time (I coming in the year  
of your last Majoralty) was my Patron and  
Incourager, your House (though a meer  
Stranger to you) my Harbor, your Acquaint-  
ance my Friends, your Off-spring my first  
Schollars, by which (then) leading act of  
yours, others were encouraged to commit their

A 4

Children

## The Epistle Dedicatory.

*Children to my Care and Direction. So that in a short time (by the blessing of God upon my endeavors) my School flourished.*

*Now as it was your Self and Family that gave life to my first Labors in this Corporation, so as a Real and Signal Testimony to the World, that I bear your favors in thankful Remembrance, I do here dedicate them to you (as in the precedent Pages, I have done to the present Rulers of this place) craving your Candid Acceptance thereof, as a pledge of my Gratitude.*

*Sir, for a close I shall here beg of God, that as from his good hand of Providence towards you, you have in your now declining age, seasonably received a happy dismissal from the Office of a Magistrate of this Town, after near Thirty years service, rendred to your Generation therein, that you may likewise receive from him, for your Lot in the end of your days, a Crown of Glory, Honor, Immortality, and Life Eternal. So prays he, that unfeignedly subscribes himself.*

Worthy Sir,

Your most Faithful Servant

John Le Duke.

To



TO THE  
READER.

*Friend,*



Y design in appearing to the World in Print, is not out of vain glory, I know many excellent *Artists* have been in this Work before me; from whose Labors I have reaped some advantage, and upon that account did I for some years, restrain the ensuing *Treatise* to the private use of my own School, by framing divers Copies to avoid the Printing it; but finding those Copies by their long use rendred imperfect and defective,  
passing

*To the Reader.*

passing through many hands, and the labor too tedious to renew them, having no spare time there-to my self, I am constrained now at last to print it for the service of my own Disciples. I thought to have published onely the several *Propositions* (or *Questions*) of every Rule without any *Directions*, being then perswaded, that the Living Voice of the *Master* would be a sufficient remedy to that defect, in resolving the several Doubts that the Schollars might meet withal in answering those *Questions*: But when the said *Questions* were ready for the Press, and communicating them to some skilful Friends, they advised me to adde some *Directions* to them, as being very needful and profitable for those that had no time to go to School;



*To the Reader.*

School; which advice I did not reject, but, yet I was loth to condescend to it upon this account, because of the variety of Operations that every Rule is subject unto, and every mans ways do not agree (each one thinking his way to be the best) therefore I thought to give the less offence (if some would take any) by publishing onely some *Arithmetical Questions*: But, on the other side, considering the shortness and uncertainty of our lives, and how beneficial Directions would be to those that are able to learn alone with a few Directions onely: I have then resolved to follow the said advice, in adding such Directions to every Rule, as I thought needful to help the meanest capacity, and not onely so, but I have added further  
at



To the Reader.

at the end of every Rule, a good quantity of *Familiar Questions* with their *Answers*, which plainly resolve the most material things of the said Rules, which I found by experience to be of great use for those that learn, and have learned this noble *Art of Arithmetick*. If any be offended and carp at my way and method, because of Non-conformity with them, and also of the quantity of the *Questions*.

I answer, 1. That my intention in publishing this *Treatise*, was not to give offence to any, but to do good, if not to all, at least to some, chusing rather to be accounted ignorant in something, then an unprofitable member.

And

## To the Reader.

And 2. The multiplicity of *Questions* is rather a help then a hinderance ; that which is need-  
less to some, will be beneficial to  
others. An apt Schollar may pass  
over many of them, whilst the  
other will be of use to *Lads* more  
slow of apprehension. I have  
used plainness of *Language* , and  
placed every *Question* in such an or-  
der, as I conceive may be to the  
best advantage of the *Learner*.  
Many of the said *Questions* have  
onely the *Facit* (or *Answer*) by it,  
that so the *Practitioner* may exercise  
himself the better in every *Rule*.  
Let my absence from the *Press*, and  
thy charity excuse the grosser, and  
thy Pen correct the lesser Faults.  
If this, the First Part, and first-  
fruits of my Labors in this soil,  
finde

*To the Reader.*

finde acceptance with thee, it shall  
encourage me in due time, with  
Gods assistance, to send forth the  
Second, and sufficiently compen-  
sate the pains of thy Friend,

*John Le Duke.*

---

# A TABLE shewing the Contents of this Book.

|   | Page. |
|---|-------|
| <b>W</b> <i>What Arithmetick is</i>                         | 1     |
| <i>Numeration</i>   | ibid. |
| <i>How to express an extraordinary great number</i>         | 7     |
| <i>Questions of Numeration with their Answers</i>           | 8     |
| <i>Numeration by Letters</i>                                | 14    |
| <i>The Explication of the chief Characters of this Book</i> | 16    |
| { <i>Table of English Money</i>                             | 17    |
| { <i>Table of Averdupois Great Weight</i>                   | 18    |
| { <i>Table of Averdupois Little Weight</i>                  | 20    |
| <i>A</i> { <i>Table of Troy Weight</i>                      | ibid. |
| { <i>Table of Dry Measures</i>                              | 21    |
| { <i>Table of Liquid Measures</i>                           | 22    |
| { <i>Table of Long Measures</i>                             | 23    |
| { <i>Table of Time</i>                                      | 24    |
| <i>Of things accounted by the Gross or Dozen</i>            | ibid. |
| <i>Addition Single</i>                                      | 25    |
| <i>Addition of Numbers of divers Denominations</i>          | 30    |
| <i>The Proof of Addition</i>                                | 44    |
| <i>Questions of Addition with their Answers</i>             | 46    |
| <i>Subtraction Single</i>                                   | 54    |
| <i>Subtraction of Numbers of divers Denominations</i>       | 63    |
| <i>The Proof of Subtraction</i>                             | 71    |
| <i>Questions of Subtraction with their Answers</i>          | 73    |
| <i>Multiplication</i>                                       | 83    |
| <i>The Proof of Multiplication</i>                          | 97    |
| <i>Questions of Multiplication with their Answers</i>       | 99    |
| <i>Division</i>   |       |

## The Contents.

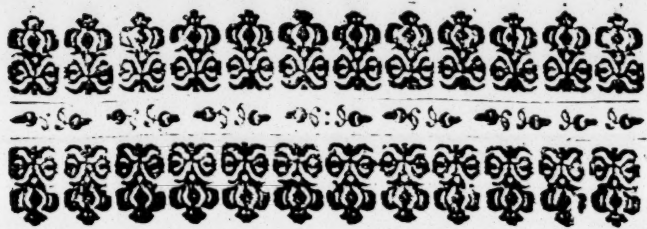
|  |     |
|--|-----|
| Division   | 106 |
| <i>A second way of Division with fewer figures</i>       | 143 |
| <i>The Proof of Division</i>                             | 150 |
| <i>Questions of Division with their Answers</i>          | 152 |
| Reduction by Multiplication                              | 173 |
| Reduction by Division                                    | 183 |
| Reduction by Multiplication and Division                 | 193 |
| <i>Questions of Reduction with their Answers</i>         | 198 |
| <i>The Rule of Three direct</i>                          | 214 |
| <i>The Proof of the Rule of Three</i>                    | 221 |
| <i>How to work the Rule of Three by Abbreviation</i>     | 232 |
| <i>Questions of the Rule of Three with their Answers</i> | 239 |

---

## In the Appendix.

|          |   |     |
|----------|---|-----|
| <b>W</b> | <i>What a Fraction is</i>   | 273 |
| <b>W</b> | <i>To know the worth of a Fraction</i>  | 274 |
|          | <i>Introduction to the Rule of Practice</i>   | 277 |
|          | <i>How to Multiply and Divide a number of several Denominations, without reducing it into its lesser Denomination</i>         | 283 |
|          | <i>The First Table of Practice</i>  | 287 |
|          | <i>The Second Table</i>   | 288 |
|          | <i>The Third Table</i>  | 289 |
|          | <i>The Fourth Table shewing the even Parts of a Told of Wool in Pound</i>   | 304 |
|          | <i>Brief Rules to know the worth of the Great and Small Hundred; and also the Way of Cheese at a certain price the Pound.</i> | 307 |
|          | <i>What</i>   |     |





## *What Arithmetick is.*



*Arithmetick* is the Art of Numbring, and teacheth how to call up exactly, all manner of Accompts, and consisteth chiefly of Five parts; viz.

*Numeration, Addition, Subtraction, Multiplication, and Division.*

### *Numeration.*

**N***umeration* teacheth how to pronounce (or write) the right value of any number propounded; and that by the help of Ten Characters, whereof Nine are significant of themselves, and the Tenth of it self, signifieth nothing, but being joyned (or placed) on the right side (or towards the right hand) of one or more

**B**

significant



## of Numeration.

significant Figures, it increaseth ten times the value thereof; the Characters are these

|             |             |               |              |              |             |               |               |              |                |
|-------------|-------------|---------------|--------------|--------------|-------------|---------------|---------------|--------------|----------------|
| 1           | 2           | 3             | 4            | 5            | 6           | 7             | 8             | 9            | 0              |
| <i>one.</i> | <i>two.</i> | <i>three.</i> | <i>four.</i> | <i>five.</i> | <i>six.</i> | <i>seven.</i> | <i>eight.</i> | <i>nine.</i> | <i>cipher.</i> |

After the knowledge of these Figures, it is requisite to know how to express, Two, three, or more of them together: For the attaining of which, it is needful to learn the following Table by heart.

### The Table of Numeration.

|  | Places. |
|--|---------|
| Unites ————— 2 ————                          | 1       |
| Tens ————— 20 ————                           | 2       |
| Hundreds ————— 200 ————                      | 3       |
| Thousands ————— 2000 ————                    | 4       |
| Ten thousands ————— 20000 ————               | 5       |
| Hundred Thousands ————— 200000 ————          | 6       |
| Millions ————— 2000000 ————                  | 7       |
| Ten Millions ————— 20000000 ————             | 8       |
| Hundred Millions ————— 200000000 ————        | 9       |
| Thousand Millions, &c. ————— 2000000000 ———— | 10      |

For the better understanding of this Table, and the use thereof, Consider what followeth.

1. The first place of the Table is called *Unites*, which shews, that any significant Figure in the first place (towards the right hand) of any number

ber propounded, is worth but its simple value; that is to say, So many Unites, as 2. in that place, is but two. 3. is but three. 4. but four, &c.

2. The second place in the said Table is called *Tens*, to shew that the Figure which is in the second place of any number (towards the left hand) is worth ten times its simple value: So that 1. in the second place, is worth ten. 2. is worth twenty. 3. thirty. 4. forty, &c.

3. The third place is called *Hundreds*, shewing that a Figure in that place, is worth an hundred times as much as its simple value. Thus, 1. in the third place is a hundred. 2. in that place is two hundred. 3. is three hundred, &c.

4. The fourth place is called *Thousands*, shewing that every Figure in that place is worth so many thousands, as it contains unites. 1. is a thousand. 2. is two thousand. 3. is three thousand, &c.

5. The fifth place is the place of *Tens of thousands*, 1. in that place is worth ten thousand. 2. is twenty thousand. 3. thirty thousand, &c.

6. The sixth place is the place of *Hundreds of thousands*. 1. in that place is worth a hundred thousand. 2. two hundred thousand, &c.

7. The seventh place is the place of *Millions*, 1. in that place is a million. 2. is two millions. 3. three millions, &c.

8. The eighth place is the place of *Tens of millions*. 1. in that place is ten millions. 2. is twenty millions. 3. thirty millions, &c.

9. The ninth place is the place of *Hundreds*

## Of Numeration.

4

*of millions.* 1. in that place is a hundred millions. 2. is two hundred millions. 3. three hundred millions, &c.

10. The tenth place is the place of *Thousands of millions*, 1. in that place is worth a thousand millions. 2. is two thousand millions. 3. three thousand millions, &c.

*Note,* The Table of *Numeration* in most Cipher-Books, goes no higher then to the tenth place, which is Thousands of millions. Some go to the twelfth place thus, *Ten thousands of millions, Hundred thousand of millions*, which is indeed high enough; for to go yet higher, is more out of curiosity, then necessity: Nevertheless, if the Learner hath a minde to go yet higher, he may do it another way by the help of other Denominations (which I met withal, both in a *Dutch* and *R. Daffont. English* Author) mentioned at the end of *Numeration*, fol. 7.

Here followeth (for the benefit of yong beginners) a quantity of Figures set two manner of ways. First, they are set in their right order from 1. to 150. And secondly, they are set confusedly to try the capacity of the Learner.

1: 2: 3: 4: 5: 6: 7: 8: 9: 10: 11: 12: 13: 14: 15:  
 16: 17: 18: 19: 20: 21: 22: 23: 24: 25: 26: 27:  
 28: 29: 30: 31: 32: 33: 34: 35: 36: 37: 38: 39:  
 40: 41: 42: 43: 44: 45: 46: 47: 48: 49: 50: 51:  
 52: 53: 54: 55: 56: 57: 58: 59: 60: 61: 62: 63:  
 64: 65: 66: 67: 68: 69: 70: 71: 72: 73: 74: 75:  
 76: 77: 78: 79: 80: 81: 82: 83: 84: 85: 86: 87:  
 88:

88: 89: 90: 91: 92: 93: 94: 95: 96: 97: 98: 99:  
 100: 101: 102: 103: 104: 105: 106: 107: 108:  
 109: 110: 111: 112: 113: 114: 115: 116: 117:  
 118: 119: 120: 121: 122: 123: 124: 125: 126:  
 127: 128: 129: 130: 131: 132: 133: 134: 135:  
 136: 137: 138: 139: 140: 141: 142: 143: 144:  
 145: 146: 147: 148: 149: 150: 160: 170: 180:  
 190: 200: 300: 400: 500: 600: 700: 800: 900:  
 1000: 2000: 3000: 4000: 5000: 10000:

1: 7: 4: 2: 0: 8: 3: 9: 5: 6: 10: 01: 17: 13: 11:  
 14: 18: 15: 19: 12: 16: 20: 02: 21: 12: 27: 30:  
 03: 31: 13: 32: 25: 37: 40: 04: 41: 14: 49: 50:  
 05: 52: 25: 54: 45: 60: 06: 63: 36: 65: 56: 70:  
 07: 76: 67: 80: 08: 81: 18: 87: 90: 09: 93: 39:  
 98: 89: 100: 001: 200: 002: 201: 210: 012: 010:  
 211: 300: 003: 301: 310: 031: 400: 004: 403:  
 024: 443: 500: 005: 510: 600: 700: 006: 007:  
 610: 017: 712: 800: 900: 1000: 0001: 1001:  
 1010: 0101: 0010: 1101: 1111: 2222: 3333:  
 1007: 2001: 3007: 4009: 38: 47: 67: 74: 92:  
 127: 317: 804: 9 3: 134: 1087: 4216: 3000:  
 0000: 001000: 7135: 1010: 3444: 12345:  
 10101: 001: 72176: 10100: 47378: 123456:  
 300111: 1234567: 12345678: 123456789:  
 800: 400: 8004003000: 131672:

654987654: Read { Six hundred fifty four mil-  
 lions nine hundred eighty  
 seven thousand six hundred  
 fifty four.

B 3

300300300:

300300300: 100000100: 203000001: 1111111:  
 401401401: 123123123: 1234567890:  
 1010101010: 00000000001: 3100001701:  
 3410010173: 1000000001: 14831768158:

649782312594: Read { Six hundred forty nine  
 thousand seven hun-  
 dred eighty two mil-  
 lions, three hundred  
 twelve thousand five  
 hundred ninety four.

123456789123: 700010070030:

If the Learner hath a minde to number a great quantity of Figures, let them be never so many, that may easily be done with other Denominations, not so troublesome to the Memory as the former, being onely acquainted with the six first places in the Table of *Numeration*, as followeth.

Suppose that a number consisting of thirty eight figures or places be propounded to be numbred, make a Partition between every six figures, beginning at the Unites, and mark how many Partitions you have, as followeth.

*Note,*



*Note*, The first six figures are termed *Units*, and have no other Denomination then is taught in the Table; but the second Partition is called *The first degree of Great thousand*; the third Partition is called *The second degree of Great thousand, &c.* as you see in the Margin. Now pronounce these thirty eight Figures thus.

Twenty of the Sixth degree of Great thousand: One hundred twenty three thousand four hundred fifty six of the Fifth degree of Great thousand: Seven hundred eighty seven thousand one hundred seventy one of the Fourth degree of Great thousand: Seven thousand one hundred eighty four of the Third degree of Great thousand: Five hundred sixty thousand three hundred

|        |                    |
|--------|--------------------|
| 20     | } Sixth degree of  |
|        | } Great thousand.  |
| 123456 | } Fifth degree of  |
|        | } Great thousand.  |
| 787171 | } Fourth degree of |
|        | } Great thousand.  |
| 007184 | } Third degree of  |
|        | } Great thousand.  |
| 560340 | } Second degree of |
|        | } Great thousand.  |
| 718723 | } First degree of  |
|        | } Great thousand.  |
| 654321 | } Unites.          |

four of the Second degree of Great thousand: Seven hundred eighteen thousand seven



## Of Numeration.

hundred twenty three of the First degree of Great thousand : Six hundred fifty four thousand three hundred twenty one.

If any other greater number were propounded to pronounce, it may be easily done this way ; therefore I shall adde here no more examples of this kinde ; yet before I conclude *Numeration*, I thought it not amiss to insert here some *Questions* with their *Answers*, about this first part of *Arithmetick*, to help the Learner to understand what hath been said ; to the end, he may be well grounded in the beginning of this Art.

### I. Question.

**W**hat is Numeration ?

*Ans.* Numeration is a Numbring, and signifieth the Explication of any Number, and the Pronunciation of the Figures.

*Quest.* 2. How many sorts of Figures (or Characters) are there to express any Number ?

*Ans.* Ten ; nine of which are significant, and the tenth of it self signifieth nothing.

*Quest.* 3. What is their shape and value, or worth ?

*Ans.* The simple value of each Figure with their shape, is as followeth. 1. One. 2. Two. 3. Three. 4. Four. 5. Five. 6. Six. 7. Seven. 8. Eight. 9. Nine. 0. a Cipher or nothing.

*Q.* 4. What do you understand by a significant Figure or Character ?

*Ans.* It is a Figure which is worth or signifieth

fieth some value in it self ; as 1. is one, 2. is two, &c.

Quest. 5. *How is the value of any Number propounded to be known?*

Ans. The worth of any Number is to be known by observing the place of every Figure.

Quest. 6. *Where must you begin to reckon the places of every Figure?*

Ans. From the right hand towards the left.

Quest. 7. *In what manner?*

Ans. In the same manner as the Table of Numeration teacheth ; to wit, *Unites, Tens, Hundreds, Thousands, &c.*

Quest. 8. *What advantage have you by the Table of Numeration?*

Ans. I know by that means the worth of every Figure.

Quest. 9. *What is the worth of every Figure in the first place?*

Ans. Every Figure in the first place, is worth but its simple value, without any increase: 1. In that place, is but one. 2. but two. 3. three, &c.

Quest. 10. *What is the second place?*

Ans. The second place is the place of *Tens*. 1. In that place is ten. 2. is twenty. 3. is thirty, &c.

Quest. 11. *What is the value of a Figure of four in the third place?*

Ans. A 4. in the third place, is worth four hundred.

Quest. 12. *What is the value of a Figure of seven in the fifth place.*

Ans.

## Of Numeration.

*Answ.* Seventy thousand, because the fifth place is the place of *Tens of thousands*, and Seven times ten thousand is seventy thousand, &c.

*Quest. 13.* When you are to pronounce any Number, where do you begin to read; from the left hand towards the right, or from the right towards the left?

*Answ.* In observing the Number of Places in saying *Unites, Tens, Hundreds, Thousands, &c.* I begin from the right hand towards the left; but in pronouncing the value of the number, I read from the left hand towards the right.

*Quest. 14.* What is the value of this Number 3245?

*Answ.* Three thousand two hundred forty five.

*Quest. 15.* How do you prove that by the Table?

*Answ.* I perceive (in observing the places) that 5 is in the place of *Unites*, 4 in the place of *Tens*, 2 in the place of *Hundreds*, and 3 in the place of *Thousands*. Therefore I conclude, that the Figure of 3 is three thousand, the 2 is two hundred, the 4 is forty, and the 5 is but five; the whole number is then Three thousand two hundred forty five.

*Quest. 16.* What is the worth of an 0 or Cipher?

*Answ.* An 0 or Cipher is worth nothing of it self.

*Quest. 17.* What use do you then make of it?

*Answ.*

*Ans.* It serveth to increase the value of the significant Figures.

*Quest. 18. Shew an example.*

*Ans.* If a Cipher be annexed to 1. (on the right hand) the value thereof is ten thus 10. If it be annexed to a 2. it is twenty, thus 20. If to 3. it is thirty, or 30, &c.

*Quest. 19. But if the Cipher stood on the left side (or towards the left hand) of the significant Figure, what increase is there?*

*Ans.* A Cipher, or many Ciphers on the left hand, doth not increase any Figure, it doth it onely being on the right; as by example, 30. is thirty, but 03. is but three: Again, 300. is three hundred, but 003. is but three: 3000. is three thousand, and 0003. is but three still. Yea, should I adde never so many Ciphers towards the left hand, it would be still the same as 00000000 3. is but three in all; but if they were on the right hand thus 300000000. then it is Three hundred millions.

*Quest. 20. How will you set down Four thousand and two?*

*Ans.* A Figure of Four, two Ciphers, and a two, thus 4002.

*Quest. 21. Why do you put two Ciphers between the 4. and the 2?*

*Ans.* It is to make up the Number of Places.

*Quest. 22. What do you mean by that?*

*Ans.* I set a Cipher (or Ciphers) in those Places where a Number (or Numbers) is left out; as in Four thousand and two, there is neither

Hu:

Hundreds nor Tens mentioned ; therefore I set Ciphers in their places to make up four places.

Quest. 23. *How will you set down Ten millions ten thousand and ten.*

Ans. I must set 1. in the place of Tens of millions, which is the eighth place) 1. in the place of Tens of thousands (which is the fifth place) and 1. in the place of tens (which is the second place) thus 10010010.

Q. 24. *How will you set Four millions six hundred ninety nine thousand five hundred and seven ?*

Ans. Thus 4699507.

Quest. 25. *How is Eleven thousand eleven hundred and eleven to be written.*

Ans. This is improperly propounded , for Eleven hundred is a Thousand and one hundred ; therefore I must set down Twelve thousand one hundred and eleven, thus 12111.

Quest. 26. *How will you express such a great number as this 454567817 ?*

Ans. Before the pronouncing of a great number , I do first observe the places, and upon every third Figure (or Character) from the right towards the left, I set a point (or prick) thus 454567817.

Quest. 27. *What advantage is there in making such marks ?*

Ans. By those marks I perceive what Figures does belong to the Millions, to the Thousands, and to the lower places, thus : The first three Figures are 817. which is Eight hundred seven-teen, the next three are 567. which being in the place



place of Thousands, is, Five hundred sixty seven thousand, and the next three are 454. which being in the place of Millions, is Four hundred fifty four millions.

Quest. 28. *How do you pronounce all the Partitions together?*

Ans. Four hundred fifty four millions, Five hundred sixty seven thousand, Eight hundred seventeen.

Quest. 29. *How will you pronounce (without confusion) a number consisting of 50. 100. or 1000. Figures?*

Ans. Though such things be needless, yet it may be easily done without confusion or great trouble.

Quest. 30. *How?*

Ans. By parting every sixth Figure; the first six (on the right hand) being counted for Unites; the second Partition for the first degree of Great thousands; the third Partition for the second degree of Great thousands, &c. as is mentioned at large in Fol. 7. To which I refer you for brevity sake.

Quest. 31. *How many sorts of Number do you finde?*

Ans. Three sorts. 1. A Digit. 2. An Article. 3. A Compound or Mixt.

Quest. 32. *What is a Digit?*

Ans. A Digit is any Number under Ten, as 9. 8. 7. 6. 5. 4. 3. 2. 1.

Quest. 33. *What is an Article?*

Ans. An Article is any Number which hath

## Of Numeration by Letters.

a Cipher in the place of Unites, as these, 10.  
20. 30. 90. 100. 340. 5090, &c.

Quest. 34. *What is a Mixt number?*

Ans<sup>r</sup>. It is a number which containeth the  
two former together, as 17. 25. 98. 124. 3417.  
&c.

## Numeration by Letters.

|    |       |    |        |     |        |
|----|-------|----|--------|-----|--------|
| 1  | I     | 20 | XX     | 61  | LXI    |
| 2  | II    | 21 | XXI    | 62  | LXII   |
| 3  | III   | 22 | XXII   | 69  | LXIX   |
| 4  | IIII  | 23 | XXIII  | 70  | LXX    |
| 4  | IV    | 24 | XXIIII | 71  | LXXI   |
| 5  | V     | 25 | XXV    | 72  | LXXII  |
| 6  | VI    | 29 | XXIX   | 79  | LXXIX  |
| 7  | VII   | 30 | XXX    | 80  | LXXX   |
| 8  | VIII  | 31 | XXXI   | 81  | LXXXI  |
| 9  | IX    | 32 | XXXII  | 82  | LXXXII |
| 10 | X     | 39 | XXXIX  | 89  | LXXXIX |
| 11 | XI    | 40 | XL     | 90  | XC     |
| 12 | XII   | 41 | XLI    | 91  | XCI    |
| 13 | XIII  | 42 | XLII   | 92  | XCII   |
| 14 | XIIII | 49 | XLIX   | 99  | XCIX   |
| 15 | XV    | 50 | L      | 100 | C      |
| 16 | XVI   | 51 | LI     | 101 | CI     |
| 17 | XVII  | 52 | LII    | 102 | CII    |
| 18 | XVIII | 59 | LIX    | 103 | CIII   |
| 19 | XIX   | 60 | LX     | 104 | CIII   |

|           |                      |
|-----------|----------------------|
| 105 CV    | 500 D or ID          |
| 110 CX    | 600 DC or IDC        |
| 119 CXIX  | 700 DCC or IDCC      |
| 120 CXX   | 800 DCCCC            |
| 121 CXXI  | 900 IXC or IDCCCC    |
| 130 CXXX  | 1000 M or CID        |
| 131 CXXXI | 1500 MD or CIDID     |
| 140 CXL   | 2000 IIM or CIDCID   |
| 150 CL    | 10000 XM or CCID     |
| 200 CC    | 50000 LM or IDDD     |
| 300 CCC   | 100000 CM or CCCIDDD |
| 400 CCCC  | 1000000 CCCCIDDDD    |

I. V. IV. VI. X. IX. XI. XV. XIV. III.  
 XVI. XX. XIX. VIII. XXIII. XXXIX.  
 XXX. XXXV. XL. LX. XLV. XLIX. L.  
 LV. LIV. LIX. LVII. LX. LXII. LXX.  
 LXIX. LXIV. LXXI. LXXII. LXXIX. LXXX.  
 LXXXIX. XCIX. XCI. C. CXIX. CL. CXL.  
 CLXII. CLXXIV. CXÇ. CIX. CLXXXIX.

CC. CCCV. VC. D. ID. DCL. IDCC.  
 DCCCLII. IXC. IDCCCLXXX. VM.  
 MDCLXI. CIDDXLVI. ID. XMC.  
 CCID. CIDCID. IDDD. LMX.  
 IDDDD. CMDCCX. CCCCIDDDD.

# The Explication of the chief Characters of this Book.

|           |                |                      |
|-----------|----------------|----------------------|
| L         | } signifieth { | Pound Sterlings.     |
| ß or s    |                | Shillings.           |
| q         |                | Pence.               |
| Q or f    |                | Farthings.           |
| Már.      |                | Marks.               |
| Nob.      |                | Nobles.              |
| Ang.      |                | Angels.              |
| ∇         |                | Crowns.              |
| Gro.      |                | Groats.              |
| C         |                | Hundreds Weight.     |
| Qrs.      |                | Quarters of Hundred. |
| ℥ or œ    |                | Pounds Weight.       |
| Oun. or ʒ |                | Ounces.              |
| Dra. or ʒ |                | Drams.               |
| Scr. or ʒ |                | Scruples.            |
| Gra.      |                | Grains.              |
| ℥ Tw.     |                | Pound Troy-weight.   |
| Pw.       |                | Penny-weight.        |
| Hh.       |                | Hogsheads.           |
| Gal.      |                | Gallons.             |
| Pot.      |                | Pottles.             |
| Qt.       |                | Quarts.              |
| Pt.       |                | Pints.               |

Note, If you finde any other Characters then what are here mentioned, they are such as need no Explication.

# A Table of English Money.

**T**He names of Money commonly used in England, are *Pounds sterling, Shillings, Pence, Farthings.* Item, *Marks, Nobles, Crowns, Half-Crowns, Groats, &c.* The value of which are as followeth.

*Pence.*

|              |         |                            |     |
|--------------|---------|----------------------------|-----|
| 1 Pound      | } makes | 20 $\beta$ or              | 240 |
| 1 Shilling   |         | 3 Groats or                | 12  |
| 1 Penny      |         | 4 Farthings                | 1   |
| 1 Mark       |         | 13 $\beta$ 4 $\text{d}$ or | 160 |
| 1 Angel      |         | 10 $\beta$ or              | 120 |
| 1 Noble      |         | 6 $\beta$ 8 $\text{d}$ or  | 80  |
| 1 Crown      |         | 5 $\beta$ or               | 60  |
| 1 Half-Crown |         | 2 $\beta$ 6 $\text{d}$ or  | 30  |
| 1 Groat      |         | 4 $\text{d}$               | 4   |
| 1 Tester     |         | 6 $\text{d}$               | 6   |

Further

|         |         |                       |
|---------|---------|-----------------------|
| 1 Pound | } makes | 2 Angels or 3 Nobles. |
| 1 Mark  |         | 2 Nobles.             |

## Of Weights.

**T**Here are three sorts of Weights, to wit, *Averdupois great weight, Averdupois little weight, and Troy weight,* the particular names of each sort, are as followeth.

C

*Averdupois*



## Averdupois great Weight.

Is a Weight by which is weighed all Commodities that are sold either by the *Tun*, *Fodder*, *Wey*, or by the *Hundred*, &c. As *Iron*, *Lead*, *Cheese*, *Tallow*, &c.

### IRON.

|            |           | lb                  |
|------------|-----------|---------------------|
| 1 Tun      | } makes { | 4 Hh. or 20 C 2240. |
| 1 Half-Tun |           |                     |
| 1 Hoghead  |           |                     |
|            |           | 2 Hh. or 10 C 1120. |
|            |           | 5 C. or 560.        |

### LEAD.

|               |           | lb                |
|---------------|-----------|-------------------|
| 1 Fodder      | } makes { | 19 C. 2 Qrs 2184. |
| 1 Half-Fodder |           |                   |
|               |           | 9 C. 3 Qrs 1092.  |

### CHEESE.

|         |           |                       |
|---------|-----------|-----------------------|
| 1 Wey   | } makes { | 32 Cloves, or 256 lb. |
| 1 Clove |           |                       |
|         |           | 8 lb.                 |

### BUTTER.

|               |           | lb                |
|---------------|-----------|-------------------|
| 1 Barrel      | } makes { | 4 Firkins or 224. |
| 1 Half-Barrel |           |                   |
| 1 Firkin      |           |                   |
|               |           | 2 Firkins or 112. |
|               |           | 56 Pounds.        |

SOPE.

SOPE.

|               |         |                |      |
|---------------|---------|----------------|------|
|               |         |                | lb   |
| 1 Barrel      | } makes | { 4 Firkins or | 240. |
| 1 Half-Barrel |         | { 2 Firkins or | 120. |
| 1 Firkin      |         | { 60 Pounds.   |      |

WOOL.

|         |         |                |       |
|---------|---------|----------------|-------|
|         |         |                | lb    |
| 1 Last  | } makes | { 12 Sacks or  | 4368. |
| 1 Sack  |         | { 13 Tods or   | 364.  |
| 1 Tod   |         | { 2 Stones or  | 28.   |
| 1 Stone |         | { 14 Pounds    | 14.   |
| 1 Pack  |         | { 12 Scores or | 240.  |

The Hundred Weight.

|           |         |              |              |
|-----------|---------|--------------|--------------|
| 1 Hundred | } makes | { 112 lb. or | 1792 Ounces. |
| 1 Half C  |         | { 56 lb. or  | 896 Ounces.  |
| 1 Qr of C |         | { 28 lb. or  | 448 Ounces.  |

The Pound.

|              |         |                          |          |
|--------------|---------|--------------------------|----------|
| 1 Pound      | } makes | { 16 Ounces or           | 128 Dra. |
| 1 Half-pound |         | { 8 Ounces or            | 64 Dra.  |
| 1 Qr of a lb |         | { 4 Ounces or            | 32 Dra.  |
| 1 lb         |         | { 14 Ounces 12 Pw. Troy. |          |

The Ounce.

|           |         |                            |            |
|-----------|---------|----------------------------|------------|
| 1 Ounce   | } makes | { 8 Drams or 24 Scruples.  |            |
| 1 Dram    |         | { 3 Scruples or 60 Grains. |            |
| 1 Scruple |         | { 20 Grains.               |            |
|           |         | C 2                        | Averdupois |

## Averdupois little Weight.

Is a Weight by which is weighed all sorts of Wares that are garbable, as *Mace, Pepper, Cloves, &c.* This Weight is divided into *Pounds, Ounces, and Drams*, as followeth.

|         |           |                       |
|---------|-----------|-----------------------|
| 1 Pound | } makes { | 16 Ounces.            |
| 1 Ounce |           | 16 Drams.             |
| 1 Dram  |           | 4 Quarters of a Dram. |

## Troy Weight.

Is a Weight by which is weighed *Gold, Silver, Bread, &c.* The common denominations of it, are *Pounds, Ounces, Penny-weights and Grains*, as followeth.

|                |           |                       |
|----------------|-----------|-----------------------|
| 1 Pound        | } makes { | 12 Ounces or 240 Pw.  |
| 1 Ounce        |           | 20 Pw. or 480 Grains. |
| 1 Penny-Weight |           | 24 Grains.            |

## Of Dry Measures.

**D**ry Measures are these, in which Dry Substances are measured; as *Corn, Salt, Coal, &c.* The particulars are as follows.

|                           |               | Pints. |
|---------------------------|---------------|--------|
| 1 Last                    | 2 Weys or     | 5120.  |
| 1 Wey                     | 5 Quarters or | 2560.  |
| 1 Chaldron                | 4 Quarters or | 2048.  |
| 1 Quarter or<br>Scam      | 2 Combs or    | 512.   |
| 1 Comb                    | 4 Bushels or  | 256.   |
| 1 Bushel Land<br>Measure  | 4 Pecks or    | 64.    |
| 1 Bushel Water<br>Measure | 5 Pecks or    | 80.    |
| 1 Peck                    | 2 Gallons or  | 16.    |
| 1 Gallon                  | 2 Pottles or  | 8.     |
| 1 Pottle                  | 2 Quarts or   | 4.     |
| 1 Quart                   | 2 Pints       | 2.     |

## Of Liquid Measures.

Liquid Measures are these, in which is measured all kinds of Liquid Substances; the Contents of which, are as followeth.

|                    |                                    |                             | Pints. |
|--------------------|------------------------------------|-----------------------------|--------|
| Wine, Oyl, & Honey | 1 Tun                              | 2 { Butts } or              | 2016.  |
|                    | 1 Butt or Pipe                     | 2 { Pipes } or              | 1008.  |
|                    | 1 Hoghead                          | 2 Hogheads or               | 504.   |
|                    | 1 Tierce                           | 63 Gallons or               | 336.   |
|                    | 1 Barrel                           | 42 Gallons or               | 252.   |
|                    | 1 Rondlee                          | 31 $\frac{1}{2}$ Gallons or | 148.   |
| Beer               | 1 Barrel                           | 18 $\frac{1}{2}$ Gallons or | 288.   |
|                    | 1 Kilderkin                        | 2 Kilderkins or             | 144.   |
|                    | 1 Firkin                           | 2 Firkins or                | 72.    |
|                    | 1 Firkin of Ale, Soap, and Herring | 9 Gallons or                | 64.    |
|                    | 1 Firkin of Salmon and Eels        | 8 Gallons or                | 84.    |
|                    | 1 Gallon                           | 10 $\frac{1}{2}$ Gallons or | 8.     |
|                    | 1 Pottle                           | 2 Pottles or                | 4.     |
|                    | 1 Quart                            | 2 Quarts or                 | 2.     |
|                    |                                    | 2 Pints                     |        |



# Of Long Measures.

Long Measure is that by which is measured Land, Board, Cloath, &c. Of which Measure a Barley Corn is the least. The particulars are as followeth.

|                     |  | Inches. |
|---------------------|--|---------|
| 1 Mile              | { 8 Furlongs } or -63360   |         |
|                     | { 320 Perches }  |         |
| 1 Furlong           | { 40 Perches } or -7920  |         |
|                     | { or Poles }   |         |
|                     | { 4 Perches broad, and 40 Perches long, or 160. square Perches, or 4 Roods } | -792    |
| 1 Acre              |  |         |
| 1 Perch             | { makes { 5 $\frac{1}{2}$ Yards or 16 $\frac{1}{2}$ Foot }                   | -198    |
| 1 Fathom            | { 6 Foot or }  | -72     |
| 1 Ell               | { 3 Foot 9 Inches, five quarters of a Yard }                                 | -45     |
| 1 Yard              | { 3 Foot or four quarters }  | -36     |
| 1 Quarter of 1 Yard | { 4 Nails }  |         |
| 1 Foot              | { 12 Inches }  | -12     |
| 1 Inch              | { 3 Barley Corns }   |         |

## of Time.

**T**ime consisteth of Years, Moneths, Weeks, Days, Hours, and Minutes, and is reckoned as followeth.

|               |         |   |
|---------------|---------|---|
| 1 Year        | } makes | 13 Moneths, 1 day and 6 hours, or 365 days. |
| 1 Moneth      |         | 4 Weeks, or 28 days.                        |
| 1 Week        |         | 7 Days.                                     |
| 1 Day natural |         | 24 Hours.                                   |
| 1 Hour        |         | 60 Minutes.                                 |

*Note,* A year is commonly reckoned for 365. days, but the *Leap-year* (which hapneth once in four years) contains 366. days. In ordinary computation of time, the whole year is commonly divided into Twelve Moneths, and each Moneth (one with another) for Thirty days.

## Of things accounted by the Gross or Dozen.

|         |         |                       |
|---------|---------|-----------------------|
| 1 Gross | } makes | 12 Dozen.             |
| 1 Dozen |         | 12 Particular things. |

## Parchment.

1 Roul makes 5 Dozen, or 60 Skins.

## Paper.

|         |         |                           |
|---------|---------|---------------------------|
| 1 Bale  | } makes | 10 Reams or — 200 Quires  |
| 1 Ream  |         | 20 Quires or — 500 Sheets |
| 1 Quire |         | 25 Sheets.                |

*Herring.*

*Herring.*

|                  |           |                      |
|------------------|-----------|----------------------|
| 1 <i>Last</i>    | } makes { | 12 <i>Barrels.</i>   |
| 1 <i>Barrel</i>  |           | 12 <i>Hundred.</i>   |
| 1 <i>Hundred</i> |           | 120 <i>Herrings.</i> |

*Addition.*

**A**ddition teacheth to adde or gather, two, three or more Sums (or Numbers) in one, either of one or divers denominations.

In adding Numbers of one denomination or name, observe what followeth.

1. Set down the Numbers to be added in such order, that every figure of the same degree (or place) may be directly one under the other, that is to say, *Unites* under *Unites*, *Tens* under *Tens*, *Hundreds* under *Hundreds*, &c.

2. Having placed the Numbers in their right places, draw a line under them, and begin at the Unites, at the lower most figure going upwards. If the whole rank (or row) of Unites (or any other, as the rank of *Tens*, *Hundreds*, &c.) be less then Ten, set down under that row so much as you finde; that is, if the rank of Unites amounts to nine, set nine under that rank; if the the rank of tens be as much or less, set down under that rank what you finde; but if you finde in any rank nothing but ciphers, then set a cipher under

under that rank, as you may see in the first, second, and third example of this Rule.

3. When the sums of the figures of any rank is above nine, as 10. 20. 100. or 16. 24. 135, &c. set down under the same rank that figure (or character) which is in the place of unites in the said sum; and for every ten, keep an unite in your minde to be added to the next row towards the left hand; that is to say, If the figures of the first row be 18. set down 8 under that row, and carry 1 in minde; if it be 24. set 4. and carry 2, &c. But if you finde 10. set a cipher, and carry 1, if 20. set a cipher and carry 2; if 100. set a cipher and carry 10, &c. as in the fourth example.

*Another way easier for Beginners to understand.*

**H**AVING set down all the Numbers to be added in their right places, cast up every row, beginning at the unites (as is said before) and set the sum of the first row on the right side of the Addition, and separate the place of the unites with a *Comma*, (or with two pricks :) Now observe for a general rule, to set down always under that row, that figure (or character) so cut and carry the other figure (or figures which are on the left side of the pricks) to the next row, towards the left hand: As for example, If the sum of the first row amounts to 39. cut the figure 9 with two pricks, thus 3:9. then set down 9. and carry 3. to the

the second row. If the sum of the second row amount unto 92. cut the 2 thus 9:2. setting down 2 under that row, and carry 9 to the third row. Further, if the sum of the third row (or any other row) did amount unto 147. do as before, cutting 7 thus 14:7. then set down 7. and carry 14. to the fourth row; but if the third row be the last, then set down 14. and the Addition is finished.

*Note,* The setting down of the sum of every row, is of a double advantage for the Learner; for (besides what hath been said) he may know at any time (in making an Addition of many figures and ranks) how much he hath carried to every row; and so, if he commit an error in the midst of his work, he shall not need to begin again from the beginning, which is somewhat tedious for impatient heads.

1. *Example.*

If 11 £ (or pounds) 10: 23: 21: 13: and 20 £. be added together, what is the whole sum? *facit* 98 pounds.

2. *Item,* in adding 2: 10: 501: 2121: 33010: and 422342. together, what is the total? *facit* 457986.

3. *Item,* if 100000: 20000: 3000: 1000: 2000: and 300000. be added together, what amounts the whole sum unto? *facit* 426000.



## of Addition.

|       |        |           |
|-------|--------|-----------|
| 1) 11 | 2) 2   | 3) 100000 |
| 10    | 10     | 20000     |
| 23    | 501    | 3000      |
| 21    | 2121   | 1000      |
| 13    | 33010  | 2000      |
| 20    | 422342 | 300000    |
| —     | —      | —         |
| 98    | 457986 | 426000    |

4. *Item*, adde 36: 138: 927: 1486: 3845: and 8069: *facit* 14501.

36 4:1  
 138 3:0  
 927 2:5  
 1486  
 3845  
 8069  
 —  
 14501

I begin at the first row (towards the right hand) at the lower figure, saying, 9 and 5 is 14, and 6 is 20, and 7 is 27, and 8 is 35, and 6 is 41. I set 41 on the right side of the Addition, and make a Partition between with two pricks, thus 4:1. I set down the 1. under that row, and carry 4 to the second row (which is the row of tens) saying 4 (which I carried) and 6 is 10, and 4 is 14, and 8 is 22, and 2 is 24, and 3 is 27, and 3 is 30. I set 30 on the right side of the Addition as before, separating it thus 3:0. I set a cipher under the second row, and carry 3 to the third row, saying, 3 that I carried and 0 is 3, and 8 is 11, and 4 is 15, and 9 is 24, and 1 is 25. I set 25 on the side as before, parting the figures thus 2:5. I set down 5 under the third row, and carry 2 to the fourth row, saying, 2 that I carried and 8 is 10, and 3 is 13, and 1 is 14; which 14 I do

I do not set down on the side of the Addition as before, because it is the last row, I set then 4 under the fourth row (which is the place of thousands) and the 1. a place further (which is the place of tens of thousands) the whole sum is then 14501. as you may see in the Margin (on the other side) follow the same order in the following Additions.

5. *Item*, adde 847 pounds, 385: 434: 967: 654: 302: 623: and 123 pounds, *facit* 4335 pounds.

6. *Item*, adde 2234 lb 9632: 8246: 7870: 8524: and 4990 lb ? *facit* 42496 lb.

7. *Item*, adde 407 yards, 4078: 26: 100: 1487: 78: 3878: 146871: and 10 ? *facit* 156935 yards.

8. *Item*, adde 37165440 foot, 4708734: 379831: 35683: 2574: 813: 70: and 12345679: foot ? *facit* 54638824 foot.

9. *Item*, adde 123456789 ells, 18: 647: 4894: 30564: 987651: 6046792: 64871404: and 170643106 ells, what is the whole sum ? *facit*. 366041865 ells.

10. *Item*, adde six bushels of Corn 28: 937: 4070: 37185: 821037: 3871309: 20308712: 1234567: 891409: 37071: 6702: 217: 10: and 3. *facit*. 27213263 bushels.

11. *Item*, adde 684329819 £. 13407389: 1834969: 606489: 13679: 560849: 6896719: 40609139: 693714569: 34678919: 6382419: 971469: 10719: 938109: 8764969: 91371019: and 654321899 £. *facit*. 2239422143 £.

12. *Item*, adde 6160018161 £. 317684671: 50143170:

*Of Addition.*

50143170: 1217163: 810718: 84646: 8161:  
 986: 67: 9: 18: 671: 6106: 17016: 8910717:  
 671076716: 3407168710: and 1000000000:  
*facit* 11617147706.

|            |      |             |     |
|------------|------|-------------|-----|
| 684329819  | 15:3 | 6160018161  | 7:6 |
| : 13407389 | 8:4  | : 317684671 | 7:0 |
| :: 1834969 | 10:1 | :: 50143170 | 6:7 |
| ::: 606439 | 9:2  | ::: 1217163 | 6:7 |
| :::: 13679 | 7:2  | :::: 810718 | 4:4 |
| ::: 569849 | 9:4  | ::::: 84646 | 3:1 |
| :: 6896719 | 4:9  | ::::: 8161  | 2:7 |
| : 40609139 | 4:3  | ::::: 986   | 2:1 |
| 693714569  |      | ::::: 67    | 1:6 |
| : 34678919 |      | ::::: 9     |     |
| :: 6382419 |      | ::::: 18    |     |
| ::: 971469 |      | ::::: 671   |     |
| :::: 10719 |      | ::::: 6106  |     |
| ::: 938109 |      | ::::: 17016 |     |
| :: 8764969 |      | ::: 8910717 |     |
| : 91371019 |      | : 671076716 |     |
| 654321899  |      | 3407168710  |     |
| <hr/>      |      | 1000000000  |     |
| 2239422143 |      | <hr/>       |     |
|            |      | 11617147706 |     |

*Addition of Numbers of divers Denominations.*

1 **I**N Addition of Numbers of divers Denominations (or names) place the numbers of the same name, one directly under another: As  
 for

for example, In the Addition of *Pounds*, *Shillings*, *Pence*, *Farthings*, set down *Pounds* under *Pounds*, *Shillings* under *Shillings*, *Pence* under *Pence*, *Farthings* under *Farthings*. In the Addition of Weight, as *Pounds*, *Ounces*, *Drams*, *Scruples*, *Grains*, set down *Pounds* under *Pounds*, *Ounces* under *Ounces*, *Drams* under *Drams*, *Scruples* under *Scruples*, *Grains* under *Grains*. Observe the same order in the Additions of other names, as *Dry*, *Long*, and *Liquid Measures*, &c. and draw a line under them.

2. In this Addition observe well the least Denomination of the Numbers to be added (which is the place where you must begin,) and how many unites of them are contained in an unite of the next greater Denomination. Now observe for a general rule, that so many unites of the greater, as you finde in the quantity of the lesser, so many unites you must carry into the place of the said greater Denomination. If you finde any remainder (or odde number) set it down, if not, set a cipher in that place. In adding the next greater Denomination, proceed in the same manner until you come to the last and greatest Denomination. As for example, In the Addition of *Pounds*, *Shillings*, *Pence*, *Farthings*, begin at the *Farthings*, and see how many *Pence* you can finde in the row of *Farthings*; and if there be any odde *Farthings* remaining, set them down under the row of *Farthings* under the line; and carry the quantity of *Pence* so found, into the row of *Pence*.

Secondly, So many *Shillings* as you finde in  
the

the row of Pence, carry them to the row of Shillings, and set the odde Pence (if there be any) under the Pence.

Thirdly, So many Angels as you finde in the row of Shillings, carry them to the place of Angels, and set the odde Shillings (if there be any) under the Shillings.

Lastly, So many Pounds as you finde in the row of Angels, carry them to the Pounds in the place of the Unites, and proceed as hath been taught in the *Addition simple*, setting down the odde Angel. Observe also, that if all the Farthings (in the row of Farthings) do not exceed Three farthings; all the Pence (in the row of Pence) do not exceed Eleven pence; all the Shillings (in the place of Shillings) do not exceed Nine shillings; all the Angels (in the place of Angels) do not exceed one Angel, then you cannot carry any thing into the place of Pence, Shillings, Angels, or Pounds, but set down every quantity under its proper Denomination, as in the following examples.

13. Adde the following sums together, viz.  
 $3 \text{ £ } 2 \text{ s } , 2 \text{ £ } 0 \text{ s } , 1 \text{ £ } 0 \text{ s } , 7 \text{ £ } 3 \text{ s } ,$   
 $4 \text{ £ } 1 \text{ s } , 6 \text{ £ } 0 \text{ s } , 0 \text{ £ } 2 \text{ s } , \text{ facit } 23 \text{ £ } 8 \text{ s } .$

14. Item, adde  $12 \text{ £ } 2 \text{ s } 2 \text{ d } , 10 \text{ £ } 1 \text{ s } 2 \text{ d } , 11 \text{ £ } 2 \text{ s } 3 \text{ d } , 21 \text{ £ } 2 \text{ s } 1 \text{ d } , 12 \text{ £ } 0 \text{ s } 1 \text{ d } , 10 \text{ £ } 10 \text{ s } 0 \text{ d } ,$  and  $13 \text{ £ } 1 \text{ s } 1 \text{ d } , \text{ facit } 89 \text{ £ } 18 \text{ s } 10 \text{ d } .$

15. Item, adde  $12 \text{ £ } 1 \text{ s } 2 \text{ d } 1 \text{ q } , 34 \text{ £ } 2 \text{ s } 1 \text{ d } 0 \text{ q } , 32 \text{ £ } 1 \text{ s } 3 \text{ d } 1 \text{ q } , 61 \text{ £ } 2 \text{ s } 2 \text{ d } 2 \text{ q } ,$



# Of Addition.

33

2  $\beta$  0  $\text{q}$  0  $\text{q}$ , 27  $\text{L}$  10  $\beta$  1  $\text{q}$  1  $\text{q}$ , 12  $\text{L}$   
 1  $\beta$  0  $\text{q}$  0  $\text{q}$ , 13  $\text{L}$  0  $\beta$  4  $\text{q}$  0  $\text{q}$ , *facit*  
 191  $\text{L}$  17  $\beta$  11  $\text{q}$  3  $\text{q}$ .

| $\text{L}$ $\beta$ | $\text{L}$ $\beta$ $\text{q}$ | $\text{L}$ $\beta$ $\text{q}$ $\text{q}$ |
|--------------------|-------------------------------|--|
| 3—2                | 12—02—2                       | 12—01—2—1                                |
| 2—0                | 10—01—2                       | 34—02—1—0                                |
| 1—0                | 11—02—3                       | 32—01—3—1                                |
| 7—3                | 21—02—1                       | 61—02—0—0                                |
| 4—1                | 12—00—1                       | 27—10—1—1                                |
| 6—0                | 10—10—0                       | 12—01—0—0                                |
| 0—2                | 13—01—1                       | 13—00—4—0                                |
| <hr/>              | <hr/>                         | <hr/>                                    |
| 23—8               | 89—18—10                      | 191—17—11—3                              |

*Note*, when you finde in the row of Farthings, Pence, Shillings, and Angels, that their numbers exceed 3. 11. 9 & 1. then for every four Farthings, carry a penny to the place of Pence; for every Twelve pence, carry a Shilling to the place of Shillings; for every Ten shillings, carry an Angel to the place of Angels; and for every two Angels, carry a Pound to the place of Pounds, as in the following example.

16. Adde 126  $\text{L}$  12  $\beta$  6  $\text{q}$  2  $\text{q}$ , 96  $\text{L}$   
 19  $\beta$  8  $\text{q}$  3  $\text{q}$ , 45  $\text{L}$  14  $\beta$  8  $\text{q}$  2  $\text{q}$ , 162  $\text{L}$   
 18  $\beta$  9  $\text{q}$  3  $\text{q}$ , and 10  $\text{L}$  9  $\beta$  2  $\text{q}$  3  $\text{q}$ ,  
*facit* 442  $\text{L}$  15  $\beta$  0  $\text{q}$  1  $\text{q}$ .

D

$\text{L}$  126

*Of Addition.*

|               |         |            |            |
|---------------|---------|------------|------------|
| $\mathcal{L}$ | $\beta$ | $\text{q}$ | $\text{q}$ |
| 126           | —12—    | 6—         | 2          |
| 96            | —19—    | 8—         | 3          |
| 45            | —14—    | 8—         | 2          |
| 162           | —18—    | 9—         | 3          |
| 10            | —09—    | 2—         | 3          |
| <hr/>         |         |            |            |
| 442           | —15—    | 0—         | 1          |

I begin with the least Denomination, which is Farthings, saying, 3 and 3 is 6, and 2 is 8, and 3 is 11, and 2 is 13 q, which is 3 q 1 q. I set down 1 q under the q, and carry 3 q to the place of q, saying, 3 I carried and 2 is 5, and 9 is 14, and 8 is 22, and 8 is 30, and 6 is 36 q, which is 3  $\beta$  just: Therefore I set a cipher under the q, and carry 3  $\beta$ , saying, 3 and 9 is 12, and 8 is 20, and 4 is 24, and 9 is 33, and 2 is 35  $\beta$ , which is 3 Angels and 5  $\beta$ ; I set 5  $\beta$  under the  $\beta$ , and carry 3 Angels to the place of Angels, saying, 3 and 0 is 3, and 1 is 4, and 1 is 5, and 1 is 6, and 1 is 7 Angels, which make 3  $\mathcal{L}$  10  $\beta$ . I set an Angel to the place of Angels, and carry 3  $\mathcal{L}$  to the place of  $\mathcal{L}$ , saying, 3 and 0 is 3, and 2 is 5, and 5 is 10, and 6 is 16, and 6 is 22  $\mathcal{L}$ . I set 2 under the place of Unites, and carry 2 tens to the place of Tens, saying, 2 I carried and 1 is 3, and 6 is 9, and 4 is 13, and 9 is 22, and 2 is 24  $\mathcal{L}$ . I set 4, and carry 2 to the next row, saying, 2 I carried and 1 is 3, and 1 is 4; which 4 I set in the place of Hundreds, which

which is the third place: The whole sum is  
442 £ 15 β 0 q 1 q.

*Note,* There is another way very easie for  
yong Learners, which is to prick at every four Far-  
things, at every Twelve pence, and at every  
Twenty shillings, setting down the rest of each  
Denomination as is said before. To make this  
more plain, I shall set down again the former  
sums to be added this way as followeth.

| £     | β  | q | q |
|-------|----|---|---|
| 126   | 12 | 6 | 2 |
| 96    | 19 | 8 | 3 |
| 45    | 14 | 8 | 2 |
| 162   | 18 | 9 | 3 |
| 10    | 09 | 2 | 3 |
| <hr/> |    |   |   |
| 442   | 15 | 0 | 1 |

I begin at the q, saying, 3 and 3 is 6 q, which  
is 1 q 2 q. I make a prick for the q, and carry  
2 q to the next figure (which is 2 q) saying 2  
and 2 is 4 q, or 1 q, I make a prick again, and  
carry nothing. Further, I say 3 and 2 is 5 q, or  
1 q 1 q, I make a prick for the q, and set the  
odde q under the q. Now I must carry 3 q into  
the place of q, because I finde three pricks in  
the row of q. I do the like in the row of q, prick-  
ing at every 12, and I finde three pricks, which  
make 3 β; and having no odde q over, I set a  
cipher in the place of q, and carry 3 β to the  
row of β. I prick likewise at every 20 in the

D 2

Shillings

Shillings and Angels (counting every Angel for 10  $\beta$ ) and in so doing I finde three pricks and 15  $\beta$  over; the odde 15  $\beta$  I set under the  $\beta$ , and carry 3  $\mathcal{L}$  (signified by the three pricks) into the place of  $\mathcal{L}$ , and I proceed as before.

*Note,* In setting down or adding Pounds, Shillings, Pence, Farthings, observe, that the Shillings (in the place of  $\beta$ ) must not exceed 19. because 20  $\beta$  make a Pound. The Pence (in the place of  $\text{d}$ ) must not exceed 11, because 12  $\text{d}$  makes a Shilling. The Farthings (in the place of  $\text{q}$ ) must not exceed 3, because 4  $\text{q}$  makes a penny. Now to put this observation into the minde of the Learners, the Twenty three and Twenty fourth Propositions of this Rule, are irregularly propounded, to teach them to set sums in a good order; for young beginners are apt to mistake in such things.

17. Adde 64  $\mathcal{L}$  13  $\beta$  6  $\text{d}$ , 48  $\mathcal{L}$  19  $\beta$  4  $\text{d}$ , 60  $\mathcal{L}$  17  $\beta$  9  $\text{d}$ , 7  $\mathcal{L}$  14  $\beta$  7  $\text{d}$ , 14  $\mathcal{L}$  10  $\beta$  4  $\text{d}$ , and 32  $\mathcal{L}$  14  $\beta$  3  $\text{d}$ , *facit* 229  $\mathcal{L}$  9  $\beta$  9  $\text{d}$ .

18. *Item*, adde 840  $\mathcal{L}$  17  $\beta$  4  $\text{d}$  3  $\text{q}$ , 547  $\mathcal{L}$  14  $\beta$  5  $\text{d}$  0  $\text{q}$ , 847  $\mathcal{L}$  15  $\beta$  6  $\text{d}$  3  $\text{q}$ , 980  $\mathcal{L}$  10  $\beta$  0  $\text{d}$  2  $\text{q}$ , 716  $\mathcal{L}$  17  $\beta$  7  $\text{d}$  0  $\text{q}$ , and 100  $\mathcal{L}$  14  $\beta$  3  $\text{d}$  1  $\text{q}$ , *facit* 3834  $\mathcal{L}$  9  $\beta$  3  $\text{d}$  1  $\text{q}$ .

19. *Item*, adde 6  $\text{d}$  2  $\text{q}$ , 8  $\text{d}$  3  $\text{q}$ , 10  $\text{d}$  0  $\text{q}$ , 11  $\text{d}$  2  $\text{q}$ , 9  $\text{d}$  1  $\text{q}$ , 8  $\text{d}$  3  $\text{q}$ , 11  $\text{d}$  1  $\text{q}$ , 10  $\text{d}$  2  $\text{q}$ , 9  $\text{d}$  1  $\text{q}$ , 10  $\text{d}$  3  $\text{q}$ , 2  $\text{d}$  0  $\text{q}$ , and 5  $\text{d}$  1  $\text{q}$ , *facit* 8  $\beta$  7  $\text{d}$  3  $\text{q}$ .

20. *Item*, adde 10  $\beta$  6  $\text{d}$  2  $\text{q}$ , 10  $\beta$  10  $\text{d}$  1  $\text{q}$ ,

1 q, 17  $\beta$  6  $\delta$  3 q, 18  $\beta$  3  $\delta$  2 q, 13  $\beta$   
10  $\delta$  1 q, 15  $\beta$  0  $\delta$  0 q, 19  $\beta$  9  $\delta$  3 q,  
and 14  $\beta$  1  $\delta$  0 q, *facit* 6  $\mathcal{L}$  0  $\beta$  0  $\delta$  0 q.

21. *Item*, adde 1  $\mathcal{L}$  10  $\beta$  11  $\delta$  3 q, 6  $\mathcal{L}$   
12  $\beta$  9  $\delta$  2 q, 0  $\mathcal{L}$  9  $\beta$  10  $\delta$  3 q, 0  $\mathcal{L}$   
13  $\beta$  8  $\delta$  2 q, 1  $\mathcal{L}$  16  $\beta$  7  $\delta$  1 q, 0  $\mathcal{L}$   
2  $\beta$  3  $\delta$  0 q, 2  $\mathcal{L}$  12  $\beta$  11  $\delta$  3 q, 0  $\mathcal{L}$   
13  $\beta$  10  $\delta$  2 q, 1  $\mathcal{L}$  15  $\beta$  9  $\delta$  3 q, 0  $\mathcal{L}$   
17  $\beta$  8  $\delta$  2 q, 0  $\mathcal{L}$  11  $\beta$  10  $\delta$  3 q, and  
0  $\mathcal{L}$  14  $\beta$  11  $\delta$  3 q, *facit* 19  $\mathcal{L}$  3  $\beta$  5  $\delta$   
3 q.

22. *Item*, adde 3  $\mathcal{L}$  13  $\beta$  3  $\delta$  3 q, 1  $\mathcal{L}$   
5  $\beta$  2  $\delta$  1 q, 1  $\mathcal{L}$  17  $\beta$  2  $\delta$  3 q, 6  $\mathcal{L}$   
3  $\beta$  9  $\delta$  3 q, 11  $\mathcal{L}$  0  $\beta$  0  $\delta$  0 q, and  
100  $\mathcal{L}$  17  $\beta$  7  $\delta$  3 q, *facit* 124  $\mathcal{L}$  17  $\beta$   
2  $\delta$  1 q.

23. *Item*, adde 13  $\mathcal{L}$  13  $\beta$  3  $\delta$  3 q, 25  $\beta$   
9 q, 36  $\beta$  14  $\delta$  3 q, 14  $\mathcal{L}$  43  $\beta$  7  $\delta$  11 q,  
20  $\mathcal{L}$  19  $\beta$  12  $\delta$ , and 200  $\mathcal{L}$  16  $\beta$  18  $\delta$   
7 q, *facit* 254  $\mathcal{L}$  17  $\beta$  2  $\delta$  1 q.

24. *Item*, adde 9  $\mathcal{L}$  1  $\beta$  2 q, 32  $\beta$  12 q,  
10 Groats, 3  $\mathcal{L}$  55  $\beta$  11  $\delta$  7 q, 1 Mark 2  $\delta$   
3 q, 1 Noble 8  $\delta$  6 q, 10  $\mathcal{L}$  2 Angels, 4  
Nobles 3  $\beta$  3  $\delta$  4 q, 16 Groats 16  $\delta$  16 q,  
6  $\mathcal{L}$  9  $\beta$  15  $\delta$  9 q, and 99  $\mathcal{L}$  19  $\beta$  11  $\delta$   
4 q, *facit* 138  $\mathcal{L}$  1  $\beta$  1  $\delta$  3 q.

25. *Item*, adde 12 Marks 1 Noble 4  $\beta$  6  $\delta$ ,  
16 Marks 1 Nob. 6  $\beta$  2  $\delta$ , 14 Mar. 0 Nob.  
5  $\beta$  8  $\delta$ , 18 Mar. 1 Nob. 4  $\beta$  9  $\delta$ , and  
20 Mar. 1 Nob. 0  $\beta$  10  $\delta$ . What is the whole  
sum in Marks? *facit* 93 Marks 1 Noble 1  $\beta$   
11  $\delta$ .



## Of Addition.

### *Averdupois Great Weight.*

For every Twenty eight pounds, carry a Quarter to the place of Quarters : For every Four quarters, carry a Hundred to the place of C.

*Note,* A pound is commonly the least quantity that is taken notice of in *Averdupois Groß Weight.*

26. Adde 7 C 2 qrs 27 lb, 4 C 2 qrs 17 lb, 0 C 3 qrs 17 lb, 4 C 2 qrs 6 lb, and 9 C 3 qrs 19 lb, *facit* 27 C 3 qrs 2 lb.

27. *Item,* adde 47 C 3 qrs 23 lb, 17 C 2 qrs 16 lb, 97 C 2 qrs 10 lb, 16 C 3 qrs 18 lb, and 84 C 0 qrs 12 lb, *facit* 264 C 0 qr 23 lb.

### *Averdupois Subtile.*

For every Twenty Grains, carry a Scruple to the place of Scruples : For every three Scruples, carry a dram to the Place of Drams ; for every eight Drams carry an Ounce to the place of Ounces ; and for every Sixteen Ounces, carry one pound to the place of Pounds.

28. Adde 34 lb 15 ounces 3 drams 1 scruple, 12 lb 7 ounce. 7 dra. 2 scrup. 21 lb 2 ounce. 1 dra. 1 scrup. 13 lb 12 ounce. 5 dra. 1 scrup. 11 lb 7 ounce. 2 dra. 2 scrup. and 30 lb 10 ounce. 1 dra. 1 scrup. *facit* 124 lb 7 ounce. 5 dra. 2 scrup.

29. *Item,* adde 487 lb 12 ounce. 6 dra. 2 scrup.

## Of Addition.

39

2 scrup. 6 grains, 814 lb 11 ounce. 5 dra. 1 scr.  
 4 gra. 984 lb 15 ounce. 4 dra. 1 scr. 2 gra.  
 471 lb 14 ounce. 2 dra. 2 scr. 3 gra. 630 lb  
 3 ounce. 1 dra. 1 scr. 5 gra. and 930 lb  
 12 ounce. 1 dra. 0 scr. 8 gra. *facit* 4320 lb  
 5 ounce. 5 dra. 2 scrup. 8 grains.

## Averdupois Little Weight.

For every Sixteen Drams, carry an Ounce to the place of Ounces; and for every Sixteen Ounces, carry One pound to the place of Pounds.

30. Adde 34 lb 10 ounce. 6 dra. 38 lb  
 15 ounce. 15 dra. 13 lb 8 ounce. 14 dra. 24 lb  
 13 ounce. 3 dra. 78 lb 5 ounce. 13 dra. 10 lb  
 15 ounce. 12 dra. and 12 lb 4 ounce. 9 dra. *facit* 213 lb 10 ounce. 8 dra.

31. *Item*, Adde 13 lb 13 ounce. 15 drams,  
 30 lb 8 ounce. 0 dra. 0 lb 0 ounce. 10 drams,  
 101  $\text{℥}$  12 ounce. 12 dra. 81  $\text{℥}$  13 ounce.  
 9 dra. 10  $\text{℥}$  7 ounce. 13 dra. and 51  $\text{℥}$   
 14 ounce. 8 dra. *facit* 290  $\text{℥}$  7 ounce. 3 dra.

## Troy Weight.

For every Twenty four Grains, carry a Penny weight to the place of Penny weights; for every Twenty penny weight, carry an Ounce to the place of Ounces; and for every Twelve Ounces, carry a Pound to the place of Pounds.

32. Adde 124  $\text{℥}$  10 ounce. 6 pw. 200  $\text{℥}$   
 3 ounce. 15 pw. 120  $\text{℥}$  8 ounce. 2 pw. 310  $\text{℥}$   
D 4 2 ounce.

*Of Addition.*

2 cunc. 10 pw. 101  $\text{æ}$  10 unc. 7 pw. and  
 350  $\text{æ}$  11 unc. 4 pw. *Facit* 1208  $\text{æ}$  10 unc.  
 4 pw.

33. *Item*, adde 67  $\text{æ}$  10 unc. 18 pw.  
 22 grains, 68  $\text{æ}$  11 unc. 16 pw. 17 grains,  
 32  $\text{æ}$  6 unc. 8 pw. 9 gra. 84  $\text{æ}$  9 unc.  
 7 pw. 3 gra. 47  $\text{æ}$  10 unc. 19 pw. 23 gra.  
 and 84  $\text{æ}$  9 unc. 15 pw. 19 grains. *Facit*  
 386  $\text{æ}$  11 unc. 6 pw. 21 grains.

*Dry Measures.*

For every Sixteen Pints, carry a Peck to the  
 place of Pecks; for every Four Pecks, carry a  
 Bushel to the place of Bushels; for every Four  
 Bushels, carry a Comb to the place of Combs;  
 and for every Two Combs, carry a Seam (or  
 Quarter) to the place of Seams.

34. Adde 17 Seams (or Quarters) 1 Comb  
 3 Bushels, 7 Seams 0 Comb 2 Bushels, 18  
 Seams 0 Comb 3 Bushels, 15 Seams 1 Comb  
 2 Bushels, 20 Seams 0 Comb 3 Bushel, and  
 2 Seams 1 Comb 2 Bushels, *Facit* 82 Seams  
 0 Comb 3 Bushels.

35. *Item*, Adde 16 Bushels 3 Pecks 12  
 Pints, 74 Bushels 2 Pecks 10 Pints, 43  
 Bushels 2 Pecks 11 Pints, 84 Bushels 3 Pecks  
 15 Pints, 23 Bushels 2 Pecks 14 Pints, and  
 78 Bushels 3 Pecks 8 Pints, *facit* 322 Bushels  
 3 Pecks 6 Pints.

*Long Measures.*

In the Addition of Yards, Quarters, Nails ; for every Four Nails carry a Quarter to the place of Quarters ; and for every Four Quarters, carry a Yard to the place of Yards.

*Item,* In the Addition of Ells, Quarters of Yards, and Nails : For every Four Nails carry a Quarter to the place of Quarters ; and for every Five Quarters, carry an Ell to the place of Ells.

*Item,* In the Addition of Foot, Inches and Quarters of Inches ; for every  $4^{\frac{1}{2}}$  Quarters of an Inch, carry an Inch to the place of Inches ; and for every Twelve Inches, carry a Foot to the place of Foots.

*Item,* In the Addition of Acres, Roods, and Pearches : For every Forty Pearches carry a Rood to the place of Roods ; and for every Four Roods carry an Acre to the place of Acres.

36. Adde 87 Yards 2 Quarters 3 Nails, 98 Yards 1 Quarter 0 Nail, 84 Yards 2 Quarters 2 Nails, 47 Yards 1 Quarter 2 Nails, and 46 Yards 2 Quarters 3 Nails, *Facit* 364 Yards 2 Quarters 2 Nails.

37. *Item,* Adde 92 Ells 2 Quarters of a Yard 3 Nails, 64 Ells 3 Quarters 2 Nails, 48 Ells 2 Quarters 2 Nails, 94 Ells 3 Quarters 3 Nails, 17 Ells 2 Quarters 0 Nail, and 97 Ells 1 Quarter 3 Nails, *facit* 415 Ells 1 Quarter 1 Nail.

38. *Item,*

## Of Addition.

38. *Item*, adde 120 Foot 10 Inches 2 Quarters of an Inch, 96 Foot 8 Inches 3 Quarters, 106 Foot 3 Inches 2 Quarters, 71 Foot 11 Inches 0 Quarter, 3 Foot 9 Inches 3 Quarters, and 12 Foot 3 Inches 2 Quarters, *facit* 411 Foot 11 Inches 0 Quarters.

39. *Item*, adde 86 Acres 3 Roods 39 Perches, 89 Acres 2 Roods 34 Perches, 16 Acres 1 Rood 3 Perches, 35 Acres 0 Rood 20 Perches, and 13 Acres 3 Roods 26 Perches, *facit* 242 Acres 0 Rood 2 Perches.

## Liquid Measures.

For every two Pints carry a Quart to the place of Quarts; for every two Quarts carry a Pottle to the place of Pottles; for every two Pottles carry a Gallon to the place of Gallons; for every Sixty three Gallons, carry a Hogshead to the place of Hogsheads; for every two Hogsheads, carry a Butt (or Pipe) to the place of Butts; and for every two Butts, carry a Tun to the place of Tuns.

40. Adde 7 Hogsheads 12 Gallons 1 Pottle 1 Quart 1 Pint, 9 Hogsheads 59 Gallons 1 Pottle 0 Quart 0 Pint, 10 Hogsheads 7 Gallons 0 Pottle 1 Quart 1 Pint, 7 Hogsheads 8 Gallons 1 Pottle 1 Quart 1 Pint, *facit* 34 Hogsheads 25 Gallons 1 Pottle 0 Quart 1 Pint.

41. *Item*, adde 10 Tuns 1 Butt 0 Hogshead 3 Gallons 1 Pottle 1 Quart 1 Pint, 3 Tuns 1 Butt



### *of Addition.*

43

1 Butt 1 Hoghead 62 Gallons 1 Pottle 1 Quart  
0 Pint, 15 Tuns 1 Butt 0 Hoghead 56 Gallons  
1 Pottle 0 Quart 0 Pint, 19 Tuns 1 Butt  
1 Hoghead 9 Gallons 0 Pottle 1 Quart 1 Pint,  
and 23 Tuns 0 Butt 0 Hoghead 57 Gallons  
1 Pottle 0 Quart 1 Pint, *facit* 101 Tuns  
0 Butt 1 Hoghead 6 Gallons 0 Pottle 0 Quart  
1 Pint.

### *Of Time.*

For every Sixty minutes, carry an hour to the place of hours; for every Twenty four hours carry a day to the place of days; for every Seven days carry a week to the place of weeks; and for every Fifty two weeks carry a year to the place of years.

In the Addition of years and days, &c. for every 365 days carry a year to the place of years.

42. *Adde* 2 Years 12 Weeks 6 Days 23 Hours, 4 Years 16 Weeks 5 Days 10 Hours, 7 Years 23 Weeks 4 Days 9 Hours, 3 Years 18 Weeks 6 Days 18 Hours, and 10 Years 3 Weeks 1 Day 8 Hours, *facit* 27 Years 23 Weeks 3 Days 20 Hours.

43. *Item*, *adde* 13 Years 10 Days 10 Hours 30 Minutes, 16 Years 58 Days 16 Hours 9 Minutes, 23 Years 24 Days 16 Hours 9 Minutes, 18 Years 10 Days 9 Hours 8 Minutes, and 21 Years 362 Days 23 Hours 50 Minutes, *facit* 92 Years 102 Days 3 Hours 46 Minutes.

*The*

## The Proof of Addition.

**T**Here are divers ways to prove Addition, I shall mention onely four.

I. Some make the Proof of Addition in casting away all the Nines of the numbers which are added together, and likewise of the total sum. If the two rests (if there be any) be equal, they conclude that the Addition is right.

II. There is another way used by others, by casting away all the Sevens of the numbers to be added, which way is more tedious and difficult than the former. These two Proofs are very uncertain, and not to be trusted; and therefore I pass them over.

III. The third is the most certain of all, but is also very tedious: The manner is thus. Subtract every number propounded in the Addition (one after another) from the total sum, and the last Substraction being finished, there will remain nothing; which shews that the Addition was right. But this kinde of Proof cannot be practised, without the knowledge of Substraction, which is the next Rule.

IV. The last sort of Proof I shall mention, is one much used in *England*, and is very easie for the new Learners: The manner is as follows. Having finished your Addition, adde again all your numbers as before, except the upper number, (which

(which you may cut off with a line, if you please)  
then adde the total of the second Addition, with  
the upper number (which was left out) the sum  
of the third Addition must be equal with the  
total of all the numbers, or the sum of the first  
Addition, as followeth. Adde 3107 £ 9322:  
1021: and 3102 £ together, facit 16552.

£

3107  
9322  
1021  
3102  
—

The first Total is-16552

Total of the Remainders-13445

Proof-16552 which is equal  
with the first Total.

*Another Example proved.*

£    β    9    q  
16—16—8—3  
10—18—9—2  
37—13—0—3  
57—07—9—2

The first Total is-122—16—4—2

The Total of the Remainders-105—19—7—3

Proof-122—16—4—2

*Note,*

*Note,* In making the Proof of Addition you may leave out what number you please, if that number be added with the sum of all the Remainders; but the upper number is commonly cut off, more for decency then necessity, and the Learner might sooner mistake if any other number were cut off.

## Questions of Addition.

Quest. 1. **VV** *What is Addition?*

*Answ.* It is a gathering of divers numbers into one sum.

Quest. 2. *In how many parts is Addition commonly divided?*

*Answ.* Into two, *Simple* and *Compound*.

Quest. 3. *What is Addition Simple?*

*Answ.* It is the gathering of two or more numbers of one kinde or name into one sum, as Pounds with Pounds, Yards with Yards, &c.

Quest. 4. *What is Addition Compound?*

*Answ.* It is the gathering of divers numbers of several names together, as Pounds, Shillings, Pence, Farthings, with £ β ʒ q, or Pounds, Ounces, Drams, &c. with lb Ounces, Drams, &c.

Quest. 5. *What must be first observed in an Addition Simple?*

*Answ.*

*Answ.* To place the numbers to be added in their right places.

*Quest. 6.* In what order must the numbers be set?

*Answ.* The Unites under the Unites, the Tens under the Tens, Hundreds under Hundreds, &c.

*Quest. 7.* What is further to be done, when the numbers are in their right places?

*Answ.* I draw a Line under the numbers, and adde every row of figures one after another.

*Quest. 8.* Where do you begin, at the right hand or at the left?

*Answ.* I begin at the right hand (which is the place of Unites) and see what the whole row of Unites amount unto.

*Quest. 9.* If the row of Unites do amount unto Twelve, what must you set down and carry?

*Answ.* I must set down two and carry one.

*Quest. 10.* Why must you set down two, and not the one.

*Answ.* Because the 2 being two Unites, must be set under the Unites, which is its proper place.

*Quest. 11.* Where must you carry the 1.

*Answ.* The one which I carry, is worth 10. Therefore I must carry it to the second place, which is the place of Tens.

*Quest. 12.* Why do you carry but 1 at 12?

*Answ.* Because I finde but once ten in twelve, for I must always carry an Unite into the next row (towards the left hand) for every ten I meet withal at any row.

*Quest.*



## of Addition.

*Quest. 13. If you finde 34 in the second row, (or in the place of Ten:) what must you set down and carry?*

*Answ.* I must set down 4 and carry 3.

*Quest. 14. Where must you set the 4, and carry the 3?*

*Answ.* I must set the 4 right under that row, where I have found the 34, and I carry the 3. to the next row towards the left hand, which is the place of Hundreds.

*Quest. 15. Why do you carry just 3.*

*Answ.* Because there is but three tens in 34.

*Quest. 16. If you finde but 9. in a row, what must you set down and carry.*

*Answ.* I should set down 9, and carry nothing, because 9. is less then 10, and I must carry nothing but ten.

*Quest. 17. If you finde just 10 in a row, what must you set down and carry?*

*Answ.* I must set down an 0 or cipher under that row, and carry 1.

*Quest. 18. If you finde 50?*

*Answ.* I must set a cipher and carry 5.

*Quest. 19. Have you a general rule (in adding any quantity of numbers) what you are to set down, and what to carry?*

*Answ.* The general rule is, to set down the figure which is in the place of Unites (of the sum found in any row of an Addition) and to carry the rest of the figures which are on the left hand.

*Quest. 20. Explain your meaning?*

*Answ.*

*Answ.* My meaning is thus. Suppose that I finde a row of figures amounting to 94. I set down the 4 (because it is that figure which stands in the place of Unites) and carry 9. because 9. stands on the left side of the said 4.

*Quest. 21.* If your sum found in a row of figures do exceed a hundred, yea, many hundreds, as by example, if you finde 427. in a row.

*Answ.* If I found 427. in a row, I should set down 7 (because it is seven Unites) and carry the two other figures, which being 42. I carry forty two to the next row, because it is forty two tens.

*Quest. 22.* But if you were at the last row of the Addition, where would you carry your 42.

*Answ.* Then I should set down 42. towards the left hand.

*Quest. 23.* If you finde in a row nothing but ciphers?

*Answ.* I must set a cipher under that row, and carry nothing.

*Quest. 24.* If you did finde 49. in the first row, and nothing but ciphers in the second.

*Answ.* I must set down 9. under the first row, and the four (I carry) under the second, and carry nothing.

*Quest. 25.* If you were to adde an extraordinary quantity of numbers?

*Answ.* If the numbers were too tedious to cast up at once, I should part them into two or three parts, and make two or three Additions, and

E

then

then I should adde together the total sums of such lesser Additions.

Quest. 26. *How will you adde numbers of divers names, as £ β Ɔ q?*

Ans. I must first set them in their right places, and draw a line under them.

Quest. 27. *How will you place them?*

Ans. I must set the Pound under the Pounds, Shillings under Shilling, Pence under Pence, Farthings under Farthings.

Quest. 28. *At what denomination do you begin, at the Farthings, or at the Pounds?*

Ans. I must begin always at the least denomination.

Quest. 29. *In casting up the row of Farthings, what must you observe?*

Ans. I must observe to set down the odde Farthings under the Farthings, and carry so many Pence as I finde in the row of Farthings.

Quest. 30. *Suppose you finde 15 q. in the row of q. what must you carry and set down?*

Ans. 15 q. is 3 Ɔ 3 q. therefore I must set down 3 q. and carry 3 Ɔ to the place of Ɔ.

Quest. 31. *What do you observe in adding the row of Ɔ?*

Ans. I must observe to carry every Shilling which I finde in the place of Pence, and set down the odde Pence under the row of Pence, if I finde any odde Pence.

Quest. 32. *Suppose you finde 28 Ɔ. in the row of Ɔ?*

Ans. 28 Ɔ is 2 β 4 Ɔ, therefore I must  
set

set down 4  $\text{ſ}$  under the  $\text{ſ}$ , and carry 2  $\text{ſ}$  to the  $\text{ſ}$ .

Quest. 33. *What do you observe in adding the row of Shillings?*

Ans. I do observe to carry so many Angels (or 10  $\text{ſ}$ ) to the place of Angels, as I finde in the row of Shillings, and if there be any odde Shillings, I set them down under the Shillings.

Quest. 34. *Suppose you finde 38  $\text{ſ}$  in the row of Shillings?*

Ans. I must set down the 8  $\text{ſ}$  and carry the three tens (which are three Angels) to the place of Angels.

Quest 35. *What do you observe in adding the Angels?*

Ans. I must carry so many Pounds to the place of Pounds, as I finde in the place of Angels; and if I finde any odde Angel, I must set it in the place of Angels.

Quest. 36. *Suppose you finde 11 Angels in the place of Angels?*

Ans. 11 Angels is 5  $\text{£}$  10  $\text{ſ}$ , therefore I must set down the odde Angel (or 10  $\text{ſ}$ ) under the Angels, and carry 5  $\text{£}$  to the first row of  $\text{£}$  which is the place of Unites.

Quest. 37. *What do you observe in adding the Pounds?*

Ans. I observe the same order as hath been answered in the Questions of Addition Simple.

Quest. 38. *In setting down any sum of money, what are you to observe?*

Ans. I must observe what hath been said al-

## Of Addition.

ready, which is to set down every sum, and their several denominations in their right places.

Quest. 39. *How many Shillings may you set down in the place of Shillings?*

Ans. But 19, because 20  $\beta$  makes 1  $\mathcal{L}$ .

Quest. 40. *And how many Pence into the place of Pence?*

Ans. But 11  $\text{d}$ , because 12  $\text{d}$  makes 1 Shilling.

Quest. 41. *And Farthings in the place of Farthings.*

Ans. But 3, because 4 Farthings makes 1 Penny.

Quest. 42. *How will you set down 25  $\beta$ ?*

Ans. 25  $\beta$  is 1  $\mathcal{L}$  5  $\beta$ , therefore I must set 1  $\mathcal{L}$  into the place of Pounds, and 5  $\beta$  into the place of  $\beta$ .

Quest. 43. *How will you set down 26  $\text{d}$ ?*

Ans. 26  $\text{d}$  is 2  $\beta$  2  $\text{d}$ , therefore I must set down 2  $\beta$  into the place of Shillings, and the 2  $\text{d}$  into the place of Pence.

Quest. 44. *How will you set down 56  $\beta$  15  $\text{d}$ .*

Ans. 56  $\beta$  is 2  $\mathcal{L}$  16  $\beta$ , and 15  $\text{d}$  is 1  $\beta$  3  $\text{d}$ , which being put together, is 2  $\mathcal{L}$  17  $\beta$  3  $\text{d}$ ; then I set 2  $\mathcal{L}$  into the place of  $\mathcal{L}$ , the 17  $\beta$  to the place of  $\beta$ , and the 3  $\text{d}$  to the place of  $\text{d}$ .

Quest. 45. *How will you set down 16 Groats and 9  $\text{q}$ ?*

Ans. 16 Groats is 5  $\beta$  4  $\text{d}$ , and 9  $\text{q}$  is 2  $\text{d}$  1  $\text{q}$ , which is together 5  $\beta$  6  $\text{d}$  1  $\text{q}$ . I set then 5  $\beta$  to the place of  $\beta$ , and the 6  $\text{d}$  to the place



place of  $\text{q}$  ; and lastly, the  $1\text{q}$  to the place of  $\text{q}$ .

Quest. 46. *How will you set down 32  $\text{L}$  and 39?*

Ans. I must set down 32  $\text{L}$  into the place of  $\text{L}$ , and a cipher in the place of  $\text{B}$ , and also a cipher in the place of  $\text{q}$ , and the 3  $\text{q}$ . into the place of  $\text{q}$ .

Quest. 47. *What do you observe in the Addition of Weights and Measures?*

Ans. I must observe the same thing observed in the Addition of Money.

Quest. 48. *What is that?*

Ans. I must observe for a general rule in setting down small Denominations, that I do not set down such a quantity of any lesser Denomination, that may amount to the worth of any greater.

Quest. 49. *Give an example of this observation in the setting down of weights.*

Ans. In setting down weight, as Hundreds, Quarters, Pounds, Ounces, Drams, Scruples, Grains, I must observe not to set above 3 in the place of Quarters, not above 27 in the place of Pounds, not above 15 in the place of Ounces, not above 7 in the place of Drams, not above 2 in the place of Scruples, and not above 19 in the place of Grains.

Quest. 50. *In dry measure, what do you observe?*

Ans. I must not set above 3 in the place of Pecks, nor 15 in the place of Pints, and so of the rest of the measures.

## Of Substraction.

Quest. 51. *How will you adde Pounds, Nobles, Shillings, and Pence, with £, Nobles, β, and 8?*

Ans<sup>r</sup>. I must adde first the quantity of 8 and shillings, as is taught before, and for every 6 β 8 8, I must carry 1 Noble to the Nobles; for 13 β 4 8, I must carry two Nobles; for 20 β three Nobles, &c. And for every three Nobles, I must carry one Pound to the place of Pounds.

## Of Substraction.

**S**ubstraction teacheth to take one or more small sums out of a greater, that the rest may be known. In *Substraction Simple*, observe what followeth.

1. Set down first the greater number, and the number to be subtracted under it, placing the figures as in *Addition*, that is to say, *Unites* under *Unites*, *Tens* under *Tens*, *Hundreds* under *Hundreds*, &c. and draw a line under them.

2. The two numbers being set in their right places, begin at the right hand (which is the place of *Unites*) and take the figures underneath (one after another) from the figures above them, and set down the rest under the line in such a manner, that the rest of the *Unites* be set down right under them,

them, the rest of the Tens right under them also, &c. as in the first example.

3. If the upper number exceed the lower in places or figure. Subtract as before, and set down these figures of the upper number (which exceed) below, under the line with the rest, observing to set them in their right places, which is towards the left hand; as in the second example.

4. If you cannot take some of the lower figures from the uppermost, by reason of their lesser value. Observe for a general rule what followeth.

First, If the first lower figure (in the place of Unites) cannot be taken from that figure above it, then borrow 1 from the next upper figure which is the second place (or the place of Tens) which 1 so borrowed, is worth 10. (because it is borrowed from the place of Tens.) Now add this Ten with the first figure of the upper number, and subtract the first lower figure from that sum, and set the rest under the line.

Secondly, Before you proceed to subtract the second lower figure from that above it, you must ever remember (if you have borrowed 1 before) to pay the debt borrowed (or to add it) to the lower figure, which is of the same place and degree, as that figure from whence it was borrowed; that is, If you borrow 1 from the second upper figure, you must add 1 to the second lower figure; if you borrow 1 from the third upper figure, you must pay (or add) 1 to the third lower figure, &c.

E 4

Thirdly,

## Of Substraction.

Thirdly, Having added the 1 so borrowed, to the second lower figure. Substract that sum from the second upper figure, if you can, if you cannot, borrow (as is said already) from the third upper figure, which 1 must be accounted for 10 (because every place exceeds the other ten times) and adde the ten so borrowed, to the second upper figure ; and from that sum, substract that number which you could not substract before, and set the rest under the line, right under the place of tens (or the second place ;) and for the 1 so borrowed from the third upper figure, adde it to the third lower figure, and proceed so, until your Substraction be finished. If you see need of borrowing, for it doth not always happen so, that you must borrow at every figure, you must borrow onely in this cause, when you see that the upper figure is less then that figure, you are to substract from it, as you may see in the third example.

### 1. Example.

If 642 be taken from 876, what is the rest?  
*facit* 234.

Set the numbers in order as followeth,

Debt 876.

Paid 642.

---

Having set the numbers in order, I begin at the lower figure ( at the Unites ) saying 2 from 6 there remains 4, which 4 I set under the line, then I go to the next lower figure (which is 4) saying,

saying, 4 from 7 there remains 3, which 3 I set down under the line, and go further to the next under figure, which is 6, saying, 6 from 8 there remains 2, which I set under the line. Now the figures which are under the line, is the rest required, which is 234 as followeth.

Debt--876.

Paid--642.

---

Rest--234.

2. Example.

In subtracting 45 from 10849. what is the rest? *facit* 10804.

Debt—10849.

Paid—45.

---

Rest—10804.

3. Example.

From 6324 take 3867, *facit* 2457 as followeth.

Debt—6324.

Paid—3867.

---

7.

I begin at the lower figure 7, saying, 7 from 4 I cannot, therefore I borrow 1 from the second upper figure 2, (according to the fourth rule, *Fol. 55.*) which 1 is 10, and 4 (the upper figure)

is



is 14. Now 7 from 14 there remains 7, which 7 I set down under the line as you see above; and for the 1 borrowed from the second upper figure, I pay it (or adde it, to the second lower figure, which is 6, saying 6 and 1 is 7; and I proceed as before, saying, 7 from 2 I cannot, therefore I borrow 1 again, (but it is from the third upper figure 3) saying, 1 that I borrow (which is 10) and 2 is 12. Now 7 (which I could not take from 2, I can now subtract, having borrowed 10) from 12 there remains 5, which 5 I set down

6324

3867

---

57

under the line, as in the Margin; and for the 1 borrowed from the third upper figure, I adde 1 to the third lower figure, which is 8, saying, 1 I borrowed and 8 is 9. Now 9 from 3 I cannot, therefore I borrow 1 from the fourth upper figure 6, which 1 is 10 and 3 is 13. Now I

6324

3867

---

457

say, 9 from 13 there remains 4, which 4 I set down under the line, as in the Margin, and for the 1 borrowed from the fourth upper figure 6, I adde 1 to the fourth lower figure 3, saying, 1 I borrowed and 3 is 4. Now 4 from 6 there remains 2: The whole rest found under the line, is 2457, as followeth,

6324

3867

---

Rest—2457.

*Note,* The Learner may note by the way, that the number from which another is to be taken, must

must be greater, or at least equal with the number to be subtracted.

*Another way of Subtraction.*

Here is another way of *Subtraction* which is yet easier for young Beginners, then what hath been taught : When some of the upper figures are less then some of the lowermost, the manner is as followeth.

When the upper figures are greater then the lowermost, or equal to them, subtract as is taught before ; but when you cannot, the under figures (or some of them) being greater then some of the uppermost, then borrow 1 from the next upper figure (as is taught before) which 1 is always to be accounted for 10. Now before you adde the 10 so borrowed to that upper figure (which was too little) subtract first the lower figure from the said 10 borrowed, and adde the rest to the upper figure, and set down under the line the sum of that Addition : And for the 1 borrowed, you must adde 1 to the next lower figure (as is taught before) going on so (if there be need of borrowing) until your *Subtraction* be finished. But to make this yet plainer to the Learner. I shall work over again the third example of this rule, as followeth.

Debt—6324

Paid—3867

---

Rest—2457

I be-

## Of Substraction.

I begin at the right hand (as before) saying, 7 from 4 I cannot, I borrow 1 from the next upper figure 2, which 1 is 10. Now 7 from 10 there remains 3 and 4 (which is above 7) is 7; which 7 I set down under the line, and the 1 that I borrowed and 6 (which is the next lower figure) is 7. Now 7 from 2 I cannot, therefore I borrow 1 from the third upper figure, which 1 is 10. I say then, 7 from 10, there remains 3 and 2 (which is above the 6) is 5, which 5 I set under the line. I say further, 1 that I borrowed and 8 is 9; from 3 I cannot, I borrow 1 again, which is 10. Now 9 from 10 there remains 1 and 3 (which is above the 8) is 4, which 4 I set under the line. Lastly, I say, 1 that I borrowed and 3 is 4. Now 4 from 6 there remains 2, which 2 I set under the line, the whole rest is 2457 as before. This way of *Substraction* I shall follow in the *Substraction* of Numbers of divers Denominations as being most easie.

4. If 1234 be taken from 3489, what is the rest? *facit* 2255.

5. *Item*, Take 134 from 1000347, *facit* 1000213.

6. *Item*, From 8162 take 1894, *facit* 6268.

7. *Item*, Take 8148 from 9106, *facit* 958.

8. *Item*, Subtract 584593 from 673582, *facit* 88889.

9. *Item*, Subtract 6309 from 9004, *facit* 2695.

*Note*, If in subtracting you have an occasion to borrow, it matters not whether such figures, from

from whom you are to borrow, be significant figures or ciphers, because you must pay (or adde) the unite so borrowed to the next lower figure: Therefore observe the working of the following *Subtraction*, which may serve for a Direction to the rest.

Debt—9004  
Paid—6309

5

I say 9 from 4 I cannot, I borrow 1 (which is 10) then 9 from 10 there remains 1, and 4 (which is above 9) is 5, which 5 I set down.

I say further, 1 that I borrowed and 0 is 1, from 0 I cannot, I borrow 1 (which is 10.) Now 1 from 10 there remains 9, which 9 I set down as in the Margin. I proceed and say, 1 that I borrowed and 2 is 4, from 0 I cannot, but 4 from 10 there remains 6, which 6 I set down as in the Margin.

Lastly, I say, 1 that I borrowed and 6 is 7. Now 7 from 9 there remains 2, which 2 I set down: The whole rest is 2695, as followeth.

9004  
6309

Rest—2695

10. *Item*, In taking 31698904 from 60850007,

60850007, what is the rest? *facit* 29151103.

11. *Item*, Subtract 6897 from 911110000, *facit* 911103103.

12. *Item*, Take 1 from 100000, *facit* 99999.

13. *Item*, Subtract 10101010101 from 101010101010, *facit* 90909090909.

14. *Item*, Take 1090108 from 3000111, *facit* 1910003.

15. *Item*, A. oweth 340 £, and he pays at one time 49 £, and at another time 57 £, what doth A. ow still? *facit* 234 £.

Adde first 49 and 57 together, and subtract the sum from 340, the rest will be 234.

16. *Item*, B. borrows at one time 138 £, at another time 79 £, a while after he pays back again 109 £. What doth he ow still? *facit* 108 £.

Adde 138 and 79 together, and subtract 109 from the sum, the rest will be 108.

17. *Item*, If 968, 408, and 926 £, be taken from 168000 £. What is the rest? *facit* 165698 £.

18. *Item*, Take 8486, 8406, and 6846 £ from 22098 £, *facit* impossible.

19. *Item*, Subtract 386491 from 289011, and 191897, *facit* 94417.

20. *Item*, From 16872, 10405, and 31497 subtract 19040, 28187, and 11547. What is the rest? *facit* 0.

21. *Item*, Subtract 1040: 4681: 8460: 7487: and 4091 from 4947: 8046: 3168: 9674: and 98400, *facit* 98476.

*Sub-*



*Substraction of Numbers of divers Denominations.*

1. **I**N *Substraction* of Numbers of divers Denominations or Names, place the Numbers in their right places (as in *Addition Compound*) which is to set down the Numbers of like Name, one directly under the other. As for example, In subtracting *Pounds, Shillings, Pence, Farthings*, place the  $\mathcal{L}$  under the  $\mathcal{L}$ ,  $\beta$  under  $\beta$ ,  $\text{q}$  under  $\text{q}$ .

In the *Substraction* of *Weights* and *Measures*, observe the same order, and draw a line under the numbers.

2. Begin at the least Denomination first, subtracting the undermost from the uppermost, and so on from the lesser to the greater, setting down the rest under the line, each Denomination in its right place; as in the first, second, and third examples of *Substraction Compound*.

3. If you finde that some, or most of the Denominations of the upper number, be lesser then the lower, observe for a general rule what followeth.

First, The same number which is carried in *Addition*, the same must be borrowed in *Substraction*, that is to say, As you did carry 1 Penny for every 4 Farthings, into the place of Pence, 1  $\beta$  for every 12  $\text{q}$ , into the place of Shillings, 1  $\mathcal{L}$  for every 20  $\beta$ , into the place of Pounds, and

and 1 for every ten in the Pound. The same numbers you must borrow in *Subtraction*; that is, for every Penny you borrow, you must reckon 4 q, for every Shilling 12 q, for every Pound, 20 β, and for every Unite in the Pounds 10.

Secondly, If the lowermost Farthings be more then the uppermost, borrow 1 q from the upper pence, which is 4 q. then subtract the lower q from 4. the rest adde to the upper q. and set that sum under the Farthings.

Thirdly, For that Penny borrowed, adde one to the lowermost pence, and the sum being greater then can be subtracted from the uppermost pence, borrow 1 β from the upper Shillings, which makes 12 q, then subtract such a number of Pence (which could not be subtracted before) from 12, and adde the rest to the uppermost pence, and set that sum down under the line in the place of Pence.

Fourthly, For that Shilling borrowed, adde one to the lowermost Shilling, and subtract that sum from the upper: If you cannot, then borrow 1 L from the upper L, which is 20 β. Now subtract that number of Shillings from 20, and adde the upper Shilling to the rest, and set down that sum under the line in the place of Shillings.

Fifthly, For that Pound borrowed, adde one to the Unites of the lowermost Pounds, and subtract as hath been taught in *Subtraction Simple*. Such manner of working is to be observed in the *Subtraction of Weights and Measures*.

22. If 11 £ 12 β be taken from 82 £ 18 β, what is the rest? *facit* 71 £ 6 β.

23. *Item*, from 34 £ 16 β 6 q subtract 12 £ 0 β 2 q, what is the rest? *facit* 22 £ 16 β 4 q.

24. *Item*, Subtracting 4 £ 0 β 0 q 2 q from 129 £ 0 β 0 q 3 q, what is the rest? *facit* 125 £ 0 β 0 q 1 q.

The working of these three Questions followeth.

|       |           |               |
|-------|-----------|---------------|
| £   β | £   β   q | £   β   q   q |
| 82—18 | 34—16—6   | 129—00—00—3   |
| 11—12 | 12—00—2   | 4—00—00—2     |
| ————— | —————     | —————         |
| 71—6  | 22—16—4   | 125—00—00—1   |

These three Subtractions are so plain, that they need no Explication, I shall say onely this, that £ is taken from £, β from β, q from q, and q from q.

25. If 342 £ 18 β 9 q 3 q be taken from 904 £ 13 β 8 q 2 q, what is the rest? *facit* 561 £ 14 β 10 q 3 q as followeth.

|       |       |       |       |
|-------|-------|-------|-------|
| £     | β     | q     | q     |
| 904—  | 13—   | 8—    | 2     |
| 342—  | 18—   | 9—    | 3     |
| ————— | ————— | ————— | ————— |
| 3     |       |       |       |

I begin at the lowermost farthings, saying, 3 from 2 that cannot be, therefore I borrow 1 q  
F
(from

## Of Subtraction.

(from the upper 9 8) which is 4 q: Now 3 q from 4 q, rest 1 q and 2 q (which are above) is 3 q; which 3 I set down under the line in the place of q, as you see above.

I proceed, saying, 1 9 that I borrowed and 9 9 is 10 9; now 10 9 from 8 9, that cannot be, therefore I borrow 1 ̄ (from the upper shilling 13) which is 12 9; now 10 9 from 12 9, rest 2 9 and 8 9 (which are above) is 10 9, which 10 I set down in the place of 9, under the line as followeth.

$$\begin{array}{r}
 \text{L} \quad \text{̄} \quad \text{9} \quad \text{q} \\
 904-13-8-2 \\
 342-18-9-3 \\
 \hline
 10-3
 \end{array}$$

I say further, 1 ̄ that I borrowed and 18 ̄ is 19 ̄, from 13 ̄ that cannot be, therefore I borrow 1 L (from the uppermost pounds) which is 20 ̄; now 19 ̄ from 20 ̄, rest 1 ̄ and 13 ̄ (which are above) is 14 ̄, which 14 I set down under the line in the place of ̄, and carry 1 L to the Unites of the undermost pounds, saying, 1 L I borrowed and 2, is 3 L, from 4 L rest 1 L, which I set in the place of pounds. And proceeding as hath been taught in Subtraction Simple, I finde the whole rest to be 561 L 14 ̄ 10 9 3 q as followeth.

|          | ℥  | β | q | q |
|----------|----|---|---|---|
| Debt—904 | 13 | 8 | 2 |   |
| Paid—342 | 18 | 9 | 3 |   |

Rem—561 14 10 3

26. Subtract 19 ℥ 17 β from 42 ℥ 13 β, facit 22 ℥ 16 β.

27. Item, From 32 ℥ 18 β 9 q, subtract 12 ℥ 19 β 2 q, facit 19 ℥ 19 β 7 q.

28. Item, Subtract 431 ℥ 13 β 4 q 1 q from 872 ℥ 18 β 6 q 3 q, facit 441 ℥ 5 β 2 q 2 q.

29. Item, Subtract 12 ℥ 18 β 10 q 2 q from 15 ℥ 17 β 7 q 1 q, facit 2 ℥ 18 β 8 q 3 q.

30. Item, From 1401 ℥ 12 β 8 q 0 q take 386 ℥ 19 β 0 q 3 q, facit 1014 ℥ 13 β 7 q 1 q.

31. Item, Subtract 319 ℥ 0 β 0 q 0 q from 967 ℥ 16 β 8 q 2 q, facit 648 ℥ 16 β 8 q 2 q.

32. Item, Subtract 1009 ℥ 16 β 11 q 2 q from 9000 ℥ 0 β 0 q 0 q, facit 7990 ℥ 3 β 0 q 2 q.

33. Item, From 30 ℥ 0 β 0 q 3 q take 18 ℥ 0 β 10 q 0 q, facit 11 ℥ 19 β 2 q 3 q.

34. Item, Subtract 72 ℥ 0 β 6 q from these two sums, viz. 36 ℥ 16 β 8 q, and 61 ℥ 12 β 8 q, facit 26 ℥ 8 β 10 q.

F 2

35. Item,



*Of Subtraction.*

35. *Item*, From 964 £ 13 β 2 q subtract  
146 £ 16 β 6 q, 460 £ 16 β 7 q, and  
64 £ 19 β 0 q, *facit* 292 £ 1 β 1 q.

36. *Item*, Subtract 48 £ 15 β 6 q and  
45 £ 0 β 8 q from 60 £ 16 β 8 q and  
40 £ 11 β 6 q, *facit* 7 £ 12 β 0 q.

37. *Item*, From 31 £ 13 β 6 q, 12 £  
14 β 3 q, and 68 £ 10 β 9 q, take 39 £  
10 β 2 q, 51 £ 11 β 7 q, and 21 £ 16 β  
9 q, what is the rest? *facit* c.

38. *Item*, A. oweth 360 Marks 0 Noble 2 β  
0 q, and he hath paid at one time 40 Marks  
1 Noble 3 β 6 q, and at another time 38  
Marks 0 Noble 6 β 2 q; how many Marks  
doth he ow still? *facit* 280 Marks 1 Noble  
5 β 8 q.

*Averdupois Great Weight.*

39. Subtract 25 C 3 qrs 13 lb from 45 C  
0 qr 27 lb, *facit* 19 C 1 qr 14 lb.

40. *Item*, Take 68 C 1 qr 26 lb from 91 C  
3 qrs 24 lb, *facit* 23 C 1 qr 26 lb.

*Averdupois Subtile.*

41. Subtract 99 lb 12 ounce. 5 drams from  
301 lb 0 ounce. 0 dram, *facit* 201 lb 3 ounce.  
3 drams.

42. *Item*, From 6487 lb 15 ounce. 3 dra.  
2 scruples, subtract 698 lb 2 ounce. 2 dra.  
1 scruple, *facit* 5789 lb 13 ounce. 1 dra. 1 scr.

43. *Item*,

## *Of Subtraction.*

69

43. *Item*, Subtract 24 lb 0 ounce. 7 dra.  
0 scr. 19 grains, from 100 lb 6 ounce. 2 dra.  
1 scr. 2 grains, *facit* 76 lb 5 ounce. 3 dra. 0 scr.  
3 grains.

## *Averdupois Little Weight.*

44. Subtract 198 lb 8 ounce. 15 dra. from  
346 lb 12 ounce. 12 dra. *facit* 148 lb 3 ounce.  
13 drams.

45. *Item*, Subtract 49 lb 15 ounce. 7 dra.  
from 82 lb 0 ounce. 0 dra. *facit* 32 lb 0 ounce.  
9 drams.

## *Troy Weight.*

46. Subtract 680 lb 11 ounce. 19 penny  
weight from 796 lb 9 ounce. 6 pw. *facit* 115 lb  
9 ounce. 7 pw.

47. *Item*, From 1684 lb 11 ounce. 0 pw.  
23 grains, subtract 108 lb 6 ounce. 6 pw.  
20 grains; *facit* 1576 lb 4 ounce. 14 pw.  
3 grains.

## *Dry Measures.*

48. From 24 Seams (or Quarters) 0 Bushel  
3 Pecks, subtract 16 Seams 7 Bushels 3 Pecks,  
*facit* 7 Seams 1 Bushel 0 Peck.

49. *Item*, Subtract 89 Bushels 1 Peck 8 Pints  
from 198 Bushels 2 Pecks 5 Pints, *facit* 109  
Bushels 0 Peck 13 Pints.

F 3

Long

# Of Subtraction.

## Long Measures.

50. Subtract 186 Acres 3 Roods 30 Perches (or Poles) from 900 Acres 2 Roods 25 Perches, *facit* 713 Acres 2 Roods 35 Perches.

51. *Item*, Subtract 486 Foot 6 Inches 2 Quarters of an Inch, from 1687 Foot 0 Inch 0 Quarter, *facit* 1200 Foot 5 Inches 2 Quarters of an inch.

52. *Item*, From 317 Yards 3 Quarters 0 Nails, take 184 Yards 0 Quarter 3 Nails, *facit* 133 Yards 2 Quarters 1 Nail.

53. *Item*, Subtract 640 Ells 0 Quarter of a Yard 3 Nails, from 686 Ells 3 Quarters 2 Nails, *facit* 46 Ells 2 Quarters 3 Nails.

54. *Item*, Subtract 34 Yards 2 Foot 6 Inches from 87 Yards 1 Foot 0 Inches, *facit* 52 Yards 1 Foot 6 Inches.

55. *Item*, Subtract 346 Fadoms 0 Foot 11 Inches from 1000 Fadoms 5 Foot 3 Inches, *facit* 654 Fadoms 4 Foot 4 Inches.

## Liquid Measures.

56. Subtract 12 Tuns 1 Butt 1 Hogshead from 27 Tuns 0 Butt 0 Hogshead, *facit* 14 Tuns 0 Butt 1 Hogshead.

57. From 60 Hogsheads 1 Gallon 0 Pottle 0 Quart 0 Pint, subtract 42 Hogsheads 59 Gallons 1 Pottle 0 Quart 1 Pint, *facit* 17 Hogsheads 4 Gallons 0 Pottle 1 Quart 1 Pint.  
Of

Of Time.

58. Subtract 17 Weeks 6 Days 20 Hours from 30 Weeks 2 Days 23 Hours, *facit* 12 Weeks 3 Days 3 Hours.

59. *Item*, From 34 Years 360 Days 0 Hour, subtract 19 Years 200 Days 12 Hour, *facit* 15 Years 159 Days 12 Hours.

60. *Item*, Subtract 99 Years 362 Days 23 Hours 4 Minutes from 1661 Years 0 Day 1 Hour 10 Minutes, *facit* 1561 Years 2 Days 2 Hours 6 Minutes.

*The Proof of Subtraction.*

THE Proof of Subtraction may be made divers ways (as the Proof of Addition.) Some do it by casting away all the Nines, and other the Sevens; but their uncertainty makes me name them onely without further trouble.

The Proofs which are most certain, are performed two ways. The first by Subtraction, and the second by Addition.

The first of these, is not so much in use as the second, the manner is thus.

Subtract the rest of the Subtraction from the upper number, and if the rest be equal to the

F 4

number

# of Subtraction.

number first subtracted, that shews that such Subtraction is right.

The second Proof is that which is most in use, and is performed by Addition, thus.

Add the rest to the sum which is subtracted, and if the sum of that Addition be equal with the uppermost sum, that shews the Subtraction to be true, as followeth.

|        | £     | β   | 9  | q   |
|--------|-------|-----|----|-----|
| Debt—  | 242   | 16  | 7  | 3   |
| Paid—  | 119   | 12  | 10 | 2   |
|        | <hr/> |     |    |     |
| Rest—  | 123   | --3 | 9  | 1   |
|        | <hr/> |     |    |     |
| Proof— | 242   | 16  | 7  | --3 |

The Proof of Subtraction of Weights and Measures is to be performed the same vway.



## Questions of Subtraction.

1. Quest. **W**hat is Subtraction?

*Answ.* Subtraction is to take a lesser number from a greater.

Quest. 2. In how many parts is this Rule commonly divided?

*Answ.* Into two; Simple and Compound.

Quest. 3. What is Subtraction Simple?

*Answ.* It is to take one lesser number from a greater of the same name or kind, thus, to take pounds from pounds, yards from yards, ells from ells, &c.

Quest. 4. What is Subtraction Compound?

*Answ.* It is to take a lesser number from a greater, being of divers denominations or names, thus; to take pounds, shillings, pence, farthings, from pounds, shillings, pence, farthings; or pounds, ounces, drams, scruples, grains, from pounds, ounces, drams, scruples, grains, &c.

Quest. 5. What is to be observed in Subtraction?

*Answ.* To set down the greater number first, and the lesser (to be subtracted) under it.

Quest. 6. How is Subtraction Simple to be wrought?

*Answ.* The two numbers are to be set down first in their right places; to wit, the greater first, then

then the lesser ; and every figure of one degree (or place) directly under one another ; that is, unites under unites, tens under tens, hundreds under hundreds, &c. and draw a line under the numbers, as in Addition.

Quest. 7. *What is further to be done ?*

Ans. To begin at the right hand, (or unites) and subtract the lower figures from the upper, one after another.

Quest. 8. *What is to be observed in Subtracting ?*

Ans. To set down the resting figures in their proper places.

Quest. 9. *In what manner ?*

Ans. In taking unites from unites, the rest must be set down under the unites, the rest of tens under the tens, the rest of hundreds under the hundreds, &c.

Quest. 10. *Must there be alwayes one number greater then the other in Substraction ?*

Ans. It is commonly so ; that the number from which the Substraction is to be made, is greater than the other ; but it must be at least equal to the number to be subtracted.

Quest. 11. *Why so ?*

Ans. Because if the number to be subtracted were greater than the other, such Substraction were impossible.

Quest. 12. *Of two numbers how do you know which is most ?*

Ans. This is a needless question, for there is none so simple but he may know that.

Quest.

Quest. 13. *Many young beginners mistake in this, setting oftentimes the greatest number under the lesser, for want of knowing them. What is then the general Rule to know the greater from the lesser?*

Ans. That number that hath most figures is greater than the other.

Quest. 14. *But if the quantity of figures be equal in both the numbers?*

Ans. Then the first figure towards the left hand of the two numbers, must be observed; and that number whose figure is greater in that place, that number is greater than the other, as by example, 20000 is more than 19999.

Quest. 15. *How will you subtract one number from another when you find some figure of the upper number lesser than the lower?*

Ans. In such a case I must borrow from the other figures towards the left hand.

Quest. 16. *How much must you borrow at a time?*

Ans. When the numbers are of one denomination, as, all pounds, all yards, &c. then I must never borrow above an unite or .

Quest. 17. *How much do you value that 1 so borrowed?*

Ans. I account it for 10. because every place exceeds the other ten times.

Quest. 18. *Clear that a little more.*

Ans. In subtracting unites from unites, If I were necessitated ( or forced ) to borrow, I should borrow 1. from the place of tens, (which is

is the very next place ) and 1. from that place is worth 10.

*Quest. 19. If you were to borrow again to supply the second place, or the place of tens.*

*Ans. Then I should borrow 1. from the third place, which is the place of hundreds, and 1. in that place is worth 10. of the second place, for 10. times 10. is 100.*

*Quest. 20. If you were to borrow again to supply the third place, What then ?*

*Ans. I should borrow 1. from the fourth place which is the place of thousands, and 1. in that place is worth ten of the third place, for ten times 100 is 1000, &c.*

*Quest. 21. What do you with that 1. which you account for ten every time you borrow ?*

*Ans. I add it with the upper figure which was too little, and I subtract the lower figure from that sum, setting down the rest directly under such figure.*

*Quest. 22. Have you no other way ?*

*Ans. Yes, In borrowing 1. (or 10.) I may subtract the lower figure from the 10. so borrowed, and add the rest to the upper figure which was too little, and I set the sum of such addition under the line, &c.*

*Quest. 23. How do you proceed in your Subtraction ?*

*Ans. For every one so borrowed I add 1. to the next lower figure.*

*Quest. 24. Answer more particularly.*

*Ans. My meaning is, If in taking unites from*

from Unites, I was forced to borrow 1 from the upper second figure, then afterward I should adde the 1 so borrowed to the second lower figure.

Quest. 25. *I understand you, you pay (or adde) the 1 you borrowed to such place (or degree) of the lower number, as you did borrow from the uppermost: Is not that your rule?*

Ans. Yes, when I must borrow 1 from the third place of the upper number, then I adde 1 to the third place of the lowermost. If I borrow 1 from the fourth upper figure, I adde 1 to the fourth lower figure, &c.

Quest. 26. *What do you further observe in taking one number from another, when some figures of the upper number are greater, and some lesser then those of the lower number?*

A. I must be careful in subtracting, that I do not make needless borrowings.

Quest. 27. *What do you mean by that?*

Ans. I mean thus, when I see that the upper figure is greater (or at least equal with the lower that I am subtracting) then I must never indebt my self by borrowing. But when the said upper figure is lesser then the undermost, then I must of necessity borrow 1, as is said before.

Quest. 28. *But must you needs always pay (or adde) the 1 so borrowed, to the next lower figure, is there no other way?*

Ans. Yes, there is another way much practised in France and Holland, but it is more difficult then the English way before mentioned; for many young beginners in those Countreys have been



been often discouraged by it, especially when they met with ciphers in the upper number.

*Quest. 29. Declare that way in few words?*

*Ans.* When it is requisite to borrow as is said before, they never add the 1 so borrowed to the next lower figure; but instead of that they reckon such upper figure (from whence the 1 is borrowed) for an unite less.

*Quest. 30. This way is harder indeed then the former for young Learners, when they meet with many ciphers together; but what must you do when you meet with ciphers in the upper number, in working the English way?*

*Ans.* I follow the general rule, which is to borrow 1 from the next upper figure, though it be but a cipher.

*Quest. 31. How can you borrow 1 from a cipher, which is worth nothing?*

*Ans.* It is true, that 1 cannot be taken from nothing, but at least I do suppose that I borrow 1 from that place, to encrease the upper figure which is too little, from whence the lower is to be taken.

*Quest. 32. Then you think this no matter where you borrow; if your want be but supplied?*

*Ans.* I do not think so; I go upon a better ground; and if I must needs tell you from whence I borrow 1, when there are few or many ciphers in the upper number, I say, that I borrow it from the next significant figure towards the left hand, in what place soever it stands.

*Quest. 33. I perceive that when the next neighboring*

boring figure is not able to lend, you go to the next (towards the left hand) and if that figure cannot, then you go yet further, till you finde a significant figure. Is it so?

*Answ.* I meant so.

Quest. 34. But if you did finde no significant figure to borrow 1?

*Answ.* If it be so, then such Substraction is impossible.

Quest. 35. When you finde ciphers in the lowermost number, what do you do with them?

*Answ.* This is not worth the asking or answering, yet because some poor shallow brained beginners, may, and do mistake sometimes in that, I shall answer you. When ciphers are in the lower number, then the upper figures (which are right above the ciphers) must be set down under the line as the rest, because, if nothing be taken from something, the same thing remains still.

Quest. 36. If you finde ciphers in both the numbers, that is ciphers above ciphers, what then?

*Answ.* If so, then I set down ciphers under the line, saying, nothing from nothing there remains nothing.

Quest. 37. You have satisfied me touching Substraction Simple: But how do you go to work in the Substraction of divers Denominations?

*Answ.* I set every number with the several Denominations in their right places, thus; Pounds under pounds, Shillings under shillings, Pence under pence, Farthings under farthings; and so  
of

of all other Subtractions of Weights and Measures drawing a line under them.

Quest. 38. *Where do you begin to Subtract, at the Pounds, or at the Farthings?*

Ans. I begin always at the least Denomination, then I take Farthings from farthings, Pence from pence, Shillings from shillings, &c. setting every rest in its proper place.

Quest. 39. *When the least Denomination cannot be taken from the uppermost least Denomination?*

Ans. Then I must go a borrowing to supply that want.

Quest. 40. *Explain your meaning?*

Ans. If I cannot subtract the lower Farthings from the upper, I go to the next Denomination, which is Pence; and from thence I borrow 1 Penny, which is 4 Farthings.

Quest. 41. *What do you wish these 4 Farthings so borrowed?*

Ans. I may dispose of them two manner of ways.

Quest. 42. *How?*

Ans. I may adde them to the upper Farthings, and subtract the lower Farthings from that sum; or else another way (which is easier, and therefore I intend to follow it) which is to subtract first the lower Farthings, from the 4 so borrowed, and adde the upper Farthings to the rest, and set that sum down under the line.

Quest. 43. *But if you finde no Farthings in the upper number?*

Ans.

*Answ.* Then I borrow 1 Penny (or 4 q) as before, and subtract onely the lower farthings from it, and set the rest under the line.

*Quest. 44. Proceed further.*

*Answ.* For the Penny so borrowed, I adde it to the lower pence, and so go on in subtracting.

*Quest. 45. If the pence of the upper number be less, then the lower?*

*Answ.* Then I borrow 1 from the next Denomination, which is Shillings, which 1  $\beta$  is 12  $\text{q}$ . Then I subtract the lower pence (with the 1  $\text{q}$  borrowed, added to them) from 12, and adde the rest to the upper pence (if there be any) and set down the rest under the line in the place of pence.

*Quest. 46. Go on, and tell me what you do with the Shilling borrowed?*

*Answ.* For the Shilling so borrowed, I adde it to the lower Shillings, and subtract that sum from the upper Shillings.

*Quest. 47. What if you cannot?*

*Answ.* Then I borrow 1 Pound (which is the next Denomination) which is 20  $\beta$ , then I subtract the lower Shilling (with the Shilling borrowed before) from 20, and adde the rest to the upper Shillings (if there be any) and I set down the sum under the line.

*Quest. 48. Is that all?*

*Answ.* No, I carry 1 pound that I borrowed to the next Denomination (which is Pounds) and so proceed as I did in *Subtraction Simple*.

## Of Substraction.

Quest. 49. *How will you subtract divers Denominations from one, as Pounds, Shillings, Pence, and Farthings from Pounds onely?*

Ans. I go the same way as is mentioned before.

Quest. 50. *How is it?*

Ans. I must borrow 1  $\text{q}$  (or 4  $\text{q}$ ) to supply the want of Farthings in the upper number.

Quest. 51. *But where will you borrow it, seeing there is no Pence in the upper number to borrow?*

Ans. I borrow that Penny from the next Significant figure that I finde, let it be in the place of Shillings or Pounds, it is no matter.

Quest. 52. *Why is it no matter where you finde the next Significant figure?*

Ans. Because the debt is paid presently when I come to the next Denomination.

Quest. 53. *How do you subtract the Pence?*

Ans. I borrow 1  $\beta$  as before, which is 12  $\text{q}$ , then I subtract the pence from 12, and set the rest under the line, and carry 1  $\beta$  to the place of Shillings, as is said before.

Quest. 54. *How do you subtract the Shillings?*

Ans. I follow the Rule, which is to borrow 1  $\text{L}$  (which is 20  $\beta$ ) and I subtract the Shillings from 20, and set the rest under the line, and carry 1  $\text{L}$  to the place of  $\text{L}$ , subtracting the rest, as is taught before.

Quest. 55. *You have given me satisfaction concerning this Rule; but I have two or three questions more to ask?*

Ans.



*Ans.* I am ready to Answer.

*Quest.* 56. *How will you subtract two, three, or more small numbers from a great?*

*Ans.* I must adde first all the small numbers together, and subtract the total sum from the greatest.

*Quest.* 57. *If you were to subtract a sum from two, three, or more small sums?*

*Ans.* I should first adde all the small sums together, and from the total sum subtract that sum which is to be subtracted.

*Quest.* 58. *How will you subtract divers sums (or numbers) from another quantity of sums?*

*Ans.* I must first adde all the sums of the debt together, and from that sum subtract the sum or total of all the other sums.

## Multiplication.

**M**ultiplication teacheth how to multiply (or encrease) two numbers, the one by the other, by which a third number is produced, which contains in it self so many times one of the numbers, as there is unites in the other. In *Multiplication* there are three numbers to be observed.

1. The *Multiplicand* or the number to be multiplied, which is always set down first.
2. The *Multiplier* or the number by which

# Of Multiplication.

you are to multiply, and is set down under the *Multiplicand*.

3. The *Product*, or the number produced by the *Multiplication* of the two former together.

Before the practising of *Multiplication*, it is very necessary to learn perfectly by heart the following Table, without which nothing can be done to any purpose.

## The Table of Multiplication.

|         |       |    |        |          |         |        |         |
|---------|-------|----|--------|----------|---------|--------|---------|
| 2 Times | { 2 } | is | { 4 }  | 5 Times  | { 5 }   | is     | { 25 }  |
|         | { 3 } |    | { 6 }  |          | { 6 }   |        | { 30 }  |
|         | { 4 } |    | { 8 }  |          | { 7 }   |        | { 35 }  |
|         | { 5 } |    | { 10 } |          | { 8 }   |        | { 40 }  |
|         | { 6 } |    | { 12 } |          | { 9 }   |        | { 45 }  |
| 3 Times | { 7 } | is | { 14 } | 6 Times  | { 6 }   | is     | { 36 }  |
|         | { 8 } |    | { 16 } |          | { 7 }   |        | { 42 }  |
|         | { 9 } |    | { 18 } |          | { 8 }   |        | { 48 }  |
|         | { 3 } |    | { 9 }  |          | { 9 }   |        | { 54 }  |
|         | { 4 } |    | { 12 } |          | 7 Times |        | { 7 }   |
| 4 Times | { 5 } | is | { 15 } | { 8 }    |         | { 56 } |         |
|         | { 6 } |    | { 18 } | { 9 }    |         | { 63 } |         |
|         | { 7 } |    | { 21 } | 8 Times  | { 8 }   | is     | { 64 }  |
|         | { 8 } |    | { 24 } |          | { 9 }   |        | { 72 }  |
| 5 Times | { 9 } |    | { 27 } |          | 9 Times | is     | { 81 }  |
|         | { 4 } |    | { 16 } |          |         |        |         |
|         | { 5 } |    | { 20 } |          |         |        |         |
|         | { 6 } |    | { 24 } |          |         |        |         |
|         | { 7 } |    | { 28 } |          |         |        |         |
| 6 Times | { 8 } | is | { 32 } | 10 Times | { 10 }  | is     | { 100 } |
|         | { 9 } |    | { 36 } |          |         |        |         |

Observe

Observe the figures which have the word *Times* adjoyning to them, and read the Table thus; Two times two is four; two times three is six; two times four is eight, &c.

*Note*, Two numbers being given to be multiplied together, it matters not which of the two is made the *Multiplicand* or *Multiplier*, for the *Product* will be still the same; yet for decency sake, and sometimes for the easiness of the working of this Rule, the number which hath most figures, is set above the other, and the lesser under it, in such order as shall be shewn in its place.

When the *Multiplicand* and *Multiplier* consist each of them of one figure onely, such *Multiplication* is called *Single*; but if any of the said number, or both, consist of more figures then one, such *Multiplication* is called *Compound*.

*How to work Multiplication.*

**T**He work of a *Single Multiplication* is very easie, the *Multiplicand* and *Multiplier* consisting each of them but of one Significant figure, the foregoing Table is a sufficient direction; therefore I shall set down here one example onely.

1. *Example.*

If 6 be given to be multiplied by 4, what is the Product? *facit* 24 as follows.

G 3

61 Mul-

of *Multiplication.*6 *Multiplicand.*4 *Multiplier.*

---

24 *Product.*

I say 4 times 6 is 24, which 24 I set down under the line, and is the *Product* required.

*When the Multiplicand consist of more Significant figures then one, and the Multiplier of one onely.*

**F**irst, Set down the *Multiplicand* and the *Multiplier* under it in such order, as in *Addition* and *Subtraction*, that is to say, the *Unites* under the *Unites*, &c. and draw a line under them.

Secondly, Multiply the first figure of the *Multiplicand* (towards the right hand) by the *Multiplier*, and set the *Product* under the line (in its right place) then go to the second figure of the said *Multiplicand*, and multiply it by the *Multiplier*, as before, and set down the *Product* under the line (right under that second figure of the *Multiplicand*) proceed so until you have multiplied all the figures of the *Multiplicand* as followeth.

2. *Example.*

2. Example.

In multiplying 123 by 2, what is the *Product* ?  
*facit* 246.

$$\begin{array}{r} 123 \\ 2 \\ \hline \end{array}$$

*Facit-246 Product.*

I say twice 3 is 6, then twice 2 is 4, and lastly, twice 1 is 2. These three *Products* 6: 4: and 2: I set down under the line, right under the figures of the *Multiplicand*, thus, The 6 under 3, the 4 under 2, and the 2 under 1, as you see before.

Thirdly, When you finde (in multiplying the *Multiplicand*) that the *Products* of any particular figure exceed 9, then you must not follow the Rule of the second Example, but set down (as in *Addition Simple*) that which is above 10: 20: 30, &c. and carry so many tens in minde; and for every 10. carry one to the next *Product* of the next figure. And if you finde nothing over the tens, as, just 10: 20: 30, &c. then set a cipher and carry the tens as before, as in the following Example.

3. Example.

$$\begin{array}{r} \text{Multiply} \quad 6485 \\ \text{by} \quad 6 \\ \hline 38910 \end{array}$$

I say 6 times 5 is 30, I set a cipher under the  
 G 4 line



## Of Multiplication.

line (right under 6) and carry 3 to the *Product* of the next figure, saying, 6 times 8 is 48, and 3 that I carried is 51. I set down 1 and carry 5 to the *Product* of the next figure, as before, saying, 6 times 4 is 24, and 5 that I carried is 29. I set down 9 and carry 2. Lastly, I say, 6 times 6 is 36, and 2 I carried is 38. I set down 8 and the 3 a place further; the whole *Product* found under the line is 38910.

4. Multiply 876 by 6, *facit* 5256.

5. *Item*, Multiply 269 by 7, *facit* 1883.

6. *Item*, Multiply 4864 by 8, *facit* 38912.

7. *Item*, Multiply 40806 by 8, *facit* 326448.

8. *Item*, Multiply 897408 by 9, *facit* 8076672.

*When the Multiplicand and Multiplier  
consist of more Significant figures then  
one.*

**W**hen the *Multiplier* consist of more figures then one, then observe that so many Significant figures as the said number hath, so many several *Products* must be set under the line, which must be set down under one another to be added in the manner following.

First, Set down first the number which hath most figures, and that will be the *Multiplicand*, and set under it the lesser in the order before-mentioned, drawing a line under them; then begin

gin with the first figure towards the right hand, proceeding as in the second Example before-mentioned.

Secondly, If the *Multiplier* consist of two figures, go to the second figure, and multiply the *Multiplicand* by it, as you did with the first, and set down the second *Product* (which proceed from the second figure) under the first, but not directly under (as is taught in *Addition*, because the second figure of the *Multiplier* is in the place of Tens) but a place further, towards the left hand, thus, The Unites of the second *Product* must be placed under the tens of the first *Product*: Further, the tens of the second *Product* must be placed under the Hundreds of the first, &c. going always a place further, then add these *Products* together; the sum is the number required, as in the following Example.

9. Multiply 2131 by 12, *facit* 25572.

2131

12

---

The first Product—4262

Second Product—2131

---

Whole Product— 25572

Thirdly, If the *Multiplier* consist of three Significant figures, you must make three several *Products*, and having set down the two first, as is said before, set the third yet a place further then the

## Of Multiplication.

the second thus. Set the *Unites* of the third *Product* under the tens of the second, the tens of the third *Product* under the *Hundreds* of the second, &c. then add the *Products* together; the sum is the number required, as in the following Example.

10. Multiply 3122 by 123, *facit* 384006.

3122

123

---

First Product—9366

The second—6244

The third—3122

---

Whole Product—384006

Fourthly, If the *Multiplier* consist of 4 figures or more, you must have so many *Products*, and place them as in the following Example.

11. Multiply 31231 by 3212, what is the *Product*? *facit* 100313972.

31231

3212

---

The first Product——62462

The second——31231

The third——62462

The fourth——93693

---

Whole Product—100313972

Fifthly, When you finde (in multiplying) that  
the

the *Product* of any particular figure exceeds 9, then do as is taught in the third Example, and set down the several *Products*, as in the Ninth, tenth, and eleventh Question (or Proposition) of this Rule, then add them together, as in the following Example.

12. Multiply 456 by 34, *facit* 15504.

$$\begin{array}{r} 456 \\ 34 \\ \hline 1824 \\ 1368 \\ \hline \end{array}$$

*Facit*—15504

13. *Item*, Multiply 8768 by 22, *facit* 192896.

14. *Item*, Multiply 595 by 47, *facit* 27965.

15. *Item*, Multiply 7891 by 71, *facit* 560261.

16. *Item*, Multiply 198468 by 98, *facit* 19449864.

17. *Item*, Multiply 64873 by 472, *facit* 30620056.

18. *Item*, Multiply 45624 by 527, *facit* 24043848.

19. *Item*, Multiply 4647 by 764, *facit* 35503844.

20. *Item*, Multiply 123456789 by 6456, what is the *Product*? *facit* 797037029784.

*How*

*How to multiply two numbers, when one or both ends with ciphers.*

**F**irst, If the *Multiplier* onely ends with ciphers having onely an unite for its Significant figure, the labor is not great, which is onely to joyn the ciphers to the *Multiplicand* on the right hand, and the work is done as followeth.

21. Multiply 32 by 10, *facit* 320.

22. *Item*, Multiply 341 by 100, *facit* 34100.

23. *Item*, Multiply 19 by 10000, *facit* 190000.

Secondly, -If the Significant figure be more then an unite or 1, or that the *Multiplier* consist of more figures then 1, ending also with ciphers, then you must multiply with the Significant figure as before, and annex (or joyn) the ciphers to that *Product* as followeth.

24. Multiply 426 by 3000, *facit* 1278000.

$$\begin{array}{r} 426 \\ 3000 \\ \hline \end{array}$$

*Facit*—1278000

25. Multiply 184123 by 90000, *facit* 16571070000.

26. *Item*, Multiply 821 by 120000, *facit* 98520000.



$$\begin{array}{r} 821 \\ 120000 \\ \hline \end{array}$$

$$\begin{array}{r} 1642 \\ 821 \\ \hline \end{array}$$

Facit—98520000

27. *Item*, Multiply 346 by 2700000, *facit* 934200000.

Thirdly, When both the *Multiplicand* and *Multiplier* ends with ciphers, then place their Significant figures under one another in the manner before taught, *Fol.* 89 and 90; and when the Multiplication of the Significant figures is finished, annex (on the right hand of that *Product*) all the ciphers which are found in both the numbers, and the work is ended, as follows.

28. Multiply 1620000 by 300, *facit* 486000000.

$$\begin{array}{r} 1620000 \\ 300 \\ \hline \end{array}$$

Facit—486000000

29. *Item*, Multiply 8530000 by 64000, *facit* 545920000000.

30. *Item*, Multiply 23500 by 1200000, *facit* 28200000000.

How

*How to multiply two numbers, when one or both have ciphers between Significant figures.*

**F**irst, When in the *Multiplicand* only you finde any cipher or ciphers together, between the Significant figures, multiply the Significant figures as before; and when you come to the ciphers, set so many 0 in the *Product* of that particular figure of the *Multiplier*, as you finde in the *Multiplicand*, if you carry nothing; but observe, if you carry any tens, set down what you carry in the place where the first 0 should stand, and set in the *Product* of that figure a cipher less then there is in the *Multiplicand*, as in the following Examples.

31. Multiply 30002 by 32, *facit* 960064.

32. *Item*, Multiply 40006 by 128, *facit* 5120768.

$$\begin{array}{r}
 30002 \\
 32 \\
 \hline
 60004 \\
 90006 \\
 \hline
 \end{array}$$

*Facit*—960064

$$\begin{array}{r}
 40006 \\
 128 \\
 \hline
 320048 \\
 80012 \\
 40006 \\
 \hline
 \end{array}$$

*Facit*—5120768

33. Multiply 80609 by 795, *facit* 64084155.

Secondly,

## Of Multiplication.

95

Secondly, When in the *Multiplier* onely you finde a cipher or ciphers together between Significant figures. Omit such ciphers, or else set so many 0 in their places, and observe well to set each particular *Product* in its right place, as is taught in the Ninth, tenth, and eleventh Examples, as followeth.

34. Multiply 3423 by 403, *facit* 1379469.

35. *Item*, Multiply 248172 by 30002, what is the *Product*? *facit* 7445656344.

$$\begin{array}{r} 3423 \\ 403 \\ \hline \end{array}$$

$$\begin{array}{r} 10269 \\ 13692 \\ \hline \end{array}$$

*Facit*-1379469

$$\begin{array}{r} 248172 \\ 30002 \\ \hline \end{array}$$

$$\begin{array}{r} 496344 \\ 744516000 \\ \hline \end{array}$$

*Facit*-7445656344

Thirdly, When both in the *Multiplicand* and *Multiplier*, you finde ciphers included between Significant figures, proceed as in the Thirty two and thirty five Examples, taking diligent care to place the several *Products* in their right places; for it is an error committed very often by young beginners, not to set the *Products* in their right places: Therefore let them observe the two following Examples.

36. Multiply 30016007 by 3002, *facit* 90108053014.

37. *Item*, Multiply 10304040901 by 1020304, *facit* 10513254147453904.

300-

## Of Multiplication.

30016007

3002

60032014

9004802100

Facit—90108053014

10304040901

1020304

41216163604

309121227030

206080818020

103040409010

Facit—10513254147453904

38. Multiply 40060 by 800800, what's the Product? facit 320512048000.

39. Item, Multiply 60000009 by 60000009, facit 3600001080000081.

40. Item, Multiply 700104 by 2004, facit 1403008416.

41. Item, Multiply 49140475 by 538064, facit 26440720540400.

42. Item, Multiply 11234567 by 16848460, facit 189285152716820.

## The Proof of Multiplication.

**T**He most certain Proof of *Multiplication* is done by *Division*, which is the next thing to be learned; and therefore I thought not to mention any Proof of *Multiplication*, until I came to treat of *Division*. But to satisfy those that have a minde to prove this Rule without *Division*, I shall make use of the common Proof of *Multiplication* (which is by casting away all the nines) for want of a better. The Rule is as followeth.

1. Cast away all the nines which are to be found in the *Multiplicand*, and what remains, set on one side of a little cross; if nothing remains, set a cipher.

2. Cast away also all the nines of the *Multipplier*, and what remains, set on the other side of the cross; if nothing remains, set a cipher.

3. Multiply these two Remainders together, and cast away the nines of the *Product*, and set the rest over the cross; if nothing remain, set a cipher.

4. Cast away all the nines of the *Product* of the *Multiplication*, and the rest must be the same with the figure which stands over the cross; if not, the work is false. As by Example,

H

Multiply



## Of Multiplication.

Multiply—4872  
by——76

---

29232

34104

---

370272

Proof

3

3 + 4

3

I cast away the nines of the *Multiplicand* first, saying, 4 and 8 is 12, cast away 9, there remains 3; then 3 and 7 is 10, cast away 9, there remains 1. Further 1 and 2 is 3, which 3 I set on the left side of the cross, as you see above.

Secondly, I go to the *Multiplier*, and cast away the nines in the same manner, saying, 7 and 6 is 13, cast away 9, there remains 4; which 4 I set down on the right side of the said cross.

Thirdly, I Multiply these two *Remainders* together, saying, 3 times 4 is 12, cast away 9, there remains 3; which 3 I set on the top of the cross.

Lastly, I cast away the nines of the *Product*, saying, 3 and 7 is 10, cast away 9, there remains 1; then 1 and 0 is 1, and 2 is 3, and 7 is 10, cast away 9, there remains 1. Further, 1 and 2 is 3, which 3 I set down at the bottom of the cross. Now, seeing that the two *Remainders* (which are at the top and bottom of the cross) are equal, that shews that the *Multiplication* is right.

Not,

*Note*, This Proof is not to be trusted, for sometimes the Proof comes right, when the work is very false. As by example, Suppose that a Learner in multiplying, should set down 46 instead of 64, or 65 for 56, such gross mistakes doth not hinder that this Proof should come right.

Yea, further, Suppose that a greater error should be committed in this manner, if that number which is to be set down, was carried in minde (in multiplying) and that which is to be carried, should be set down (thus, If for 39, three were set down, and the 9 carried in minde, &c.) such sad mistakes doth not yet hinder this kinde of Proof to come right: Which thing proves the great uncertainty of this Proof.

## *Questions of Multiplication.*

Quest. 1. **VV** *What is Multiplication?*

*Answ.* Multiplication is to multiply (or encrease) two numbers together, to finde a third.

Quest. 2. *In how many parts is this Rule divided?*

*Answ.* In two, Single and Compound.

Quest. 3. *What is the first?*

*Answ.* The first is called *Multiplication Single.*

H 2

Quest.

## Of Multiplication.

Quest. 4. *Why is it so called?*

Ans. Because the two numbers to be multiplied, are but single figures.

Quest. 5. *Give an example.*

Ans. If 4 were to be multiplied by another single figure, as 7 or 8; such Multiplication is called *Single* or *Simple*.

Quest. 6. *What is Multiplication Compound?*

Ans. It is so called, when one or both the numbers to be multiplied, consist of more figures than one.

Quest. 7. *What is to be observed in Multiplication?*

Ans. There are three numbers to be minded.

Quest. 8. *What are they?*

Ans. The *Multiplicand*, the *Multiplier*, and the *Product*?

Quest. 9. *What is the Multiplicand?*

Ans. It is commonly the number which is set down first to be multiplied.

Quest. 10. *What number is called Multiplier?*

Ans. The *Multiplier* is the number by which the *Multiplicand* is multiplied.

Quest. 11. *May these two first numbers exchange their names?*

Ans. Yes; you may chuse which you please to be the *Multiplicand*, and the other shall be the *Multiplier*.

Quest. 12. *What number do you rather chuse of the two, for the Multiplicand?*

Ans. I chuse the fittest number to be the *Multiplicand*,

*Multiplicand*, which is the number that hath most figures

Quest. 13. *Why is that number the first?*

Ans. Because, if I take the number which hath most figures for the *Multiplier*, the work will be greater then otherwise.

Quest. 14. *Make that plain?*

Ans. The whole *Multiplicand* must be multiplied by each figure of the *Multiplier*; and therefore the more figures that number hath, the more *Products* there will be.

Quest. 15. *What do you mean by Product?*

Ans. The *Product* of a *Multiplication*, is the third part of it, as is said before.

Quest. 16. *Explain that?*

Ans. When two numbers are multiplied together, the number which is produced from such *Multiplication*, is called *Product*.

Quest. 17. *Give an example.*

Ans. If 9 were multiplied by 4, saying, 4 times 9 is 36. Now observe that 9 is the *Multiplicand*, 4 is the *Multiplier*, and 36 is the *Product*.

Quest. 18. *To what use is Multiplication?*

Ans. *Multiplication* serveth instead of many *Additions*.

Quest. 19. *Shew it.*

Ans. In multiplying 8 by 7, the *Product* is 56. Now if I set down seven times 8 one under another, as in *Addition*, and adding them together, the sum will be 56, as before.

## of Multiplication.

Quest. 20. *What doth contain the number you call Product?*

Ans. The *Product* contains in it self so many times one of the two other numbers, as there is Unites in the other.

Quest. 21. *Explain what you say, in giving an example.*

Ans. If 6 be multiplied by the 4, the *Product* is 24. Now 24 contains 6 four times, or else it contains 4 six times.

Quest. 22. *What is the next thing to be known?*

Ans. The next thing is to practise *Multiplication*.

Quest. 23. *Is there nothing to be learned before that?*

Ans. Yes; the Table is to be learned perfectly by heart.

Quest. 24. *What is to be observed in multiplying a number by another?*

Ans. I observe to set down the *Multiplicand* first, and the *Multiplier* under it.

Quest. 25. *In what manner?*

Ans. The Unites of one number under the Unites of the other, and so Tens under Tens, &c. drawing a Line under them.

Quest. 26. *Where do you begin to multiply?*

Ans. I begin at the right hand, at the place of Unites.

Quest. 27. *Go on.*

Ans. I multiply all the figures of the *Multiplicand* by every figure of the *Multiplier* (one after another) and set down the *Products*



ducts under the Line, and then I adde them together.

Quest. 28. *Speak more particul'arly?*

Ans. I shall then begin to speak of such Multiplications, whose Multiplier is but a single figure.

Quest. 29. *Go on in the plainest way to be understood.*

Ans. When the Multiplier consists of one figure onely, I multiply the whole Multiplicand with that figure, and I set the Products of every figure under the Line, as in the second example of Multiplication, Fol. 87.

Quest. 30. *But if the Product of each figure so multiplied, doth exceed 9, what then?*

Ans. I must set down what is above 10, 20, 30, &c. and carry so many tens in minde; and for every 10 I carry one to the Product of the next figure, as in the third example Fol. 88.

Quest. 31. *What if the Product of each figure ends with a cipher, as 10, 20, 30, &c.*

Ans. Then I set a cipher under the Line, and carry so many tens as before.

Quest 32. *If the Multiplier consist of more figures then one.*

Ans. I must set down so many several Products under the Line, as there are figures in the Multiplier.

Quest. 33. *If the Multiplier consist of four figures?*

Ans. I must set down four several Products under the Line to be added together.

## Of Multiplication.

*Quest. 34. In what manner do you p'ace your several Products.*

*Ans.* The second Product must not be set down directly under the first (as the numbers in Addition) but it must stand a figure (or place) further towards the left hand, the third Product yet a place further, &c.

*Quest. 35. What is the reason of that?*

*Ans.* The second Product ariseth from the Multiplication of the second figure of the Multiplier, which is the place of Tens, and therefore the Product of that figure must be a place further (towards the left hand) then the first Product.

*Quest. 36. Why is the third Product, set a place further then the second?*

*Ans.* Because the figure, from whence such Product ariseth, is in the third place in the Multiplier, which is the place of Hundreds.

*Quest. 37. You do then observe of what degree or place, is every figure in the Multiplier?*

*Ans.* I do observe for a general Rule, that the first figure (towards the right hand) of any Product (which is set under the Line) must be set down directly under that figure (which is in the Multiplier) from whence such Product is produced; and the other figures must stand towards the left hand.

*Quest. 38. When all the several Products are set in their right places, what is more to be done to finish the Multiplication?*

*Ans.* There is nothing to do, but to add the several

several *Products* into one sum, and that sum is the whole *Product* required.

*Quest. 39. What course do you take, when the Multiplicand and Multiplier do end with ciphers?*

*Ans.* The general Rule holds true, as you may see in the Twenty sixth and Twenty eighth Examples of *Multiplication*, Fol. 92 and 93. And though some ciphers are omitted in the *Products* of the Twenty sixth Example for shortness sake, yet they are annexed to the general (or whole) *Product*.

*Quest. 40. But if you finde ciphers between Significant figures, in the Multiplicand and Multiplier; what must you do?*

*Ans.* The general Rule given in the Answer of the Thirty seven *Question*, may suffice. I refer you to the operation of the 31, 32, 34 and 35 Examples of *Multiplication*, where you may see the said Rule verified.

---

*Division*

## Division.

**D**ivision teacheth to finde how many times one number is contained in another; or how to divide a number propounded into any equal parts assigned.

In *Division* there are chiefly three Numbers to be observed.

1. The *Dividend* or the Number to be divided.
2. The *Divisor*, or the Number by which the *Dividend* is to be divided.
3. The *Quotient* or the Number produced by the *Division*, which shews how often the *Divisor* is contained in the *Dividend*.

Some adde a fourth Number, which is the Rest or Remainder; but this Number is not always to be found in *Division*, as the three former are; for oftentimes in dividing, there is no Rest.

The Learner may take notice by the way, that the Rest (or Remainder) of any *Division*, is, and ought to be always less then the *Divisor*: And if it happen to be either equal, or more then the *Divisor*, that shews that the *Quotient* is too little, and the work false.

*Division* is the true Proof of *Multiplication*, and is more difficult then any Rule before taught, and therefore the Learner ought to double the File of his diligence, and observe well the Rules  
and

and Examples that follows, which will make the way smooth to the meanest capacity.

There are divers ways of performing *Division*, but I shall content myself to treat of two onely. But before any dare venture upon the practice of this part of *Arithmetick*, he must be well versed (or acquainted) in *Substraction* and *Multiplication*; in the knowledge of which, *Division* doth wholly depend. Observe what followeth in dividing.

1. Set down first the *Dividend*, and the *Divisor* under it, not in the same manner as the two numbers of *Multiplication* are set, but quite contrary: For in that Rule, the *Multiplier* is set on the right hand, but the *Divisor* (in this Rule) must be set on the left hand of the *Dividend*, thus. Place them so, that the figures towards the left hand of each number, be directly one under the other, if the figures of the *Dividend* (which stand right above the whole *Divisor*) will permit it: For if all those said figures of the *Dividend* be less in value then the whole *Divisor*, then the said *Divisor* must not be placed so, but a place further towards the right hand, and draw a crooked line on the right side of the *Dividend*.

2. Having placed the *Divisor* in its right place, consider well how many times your *Divisor* is contained in the figures above it, which being known, set down that figure (which answers the question) in the crooked line, which is the place of the *Quotient*.

3. The



3. The whole *Divisor* must be multiplied with that figure, which is placed in the *Quotient*, and the *Product* must be subtracted from the figures which are above the said *Divisor*, in this manner.

Multiply first, the first figure (towards the left hand) of your *Divisor*, by the figure in the *Quotient*, and subtract that *Product* from the figures which are above the said figure so multiplied. If you finde any Rest, set it above, and forget not as you go along, to cancel your figures that have been used, to prevent error and mistake.

Further, Multiply the next figure of your *Divisor*, by the same figure in the *Quotient*, and subtract the *Product* from those figures which are above the said figure so multiplied, as before. Proceed, and do the like with the third figure, and so with the rest of the *Divisor*, taking good heed to set the several Rests in their right places.

4. Observe, That so many times as the *Divisor* can be removed under the *Dividend*, so many figures you must have in the *Quotient*. Having then finished the work of the first figure of your *Quotient*, remove the *Divisor* a place further towards the right hand (if you see some figure of the *Dividend* untouched) then observe again, how many times you can have the lower figures in the upper, whither 0: 1: 2: 3: 4: 5: 6: 7: 8: or 9 times (for 9 is the highest figure you can take at once,) which thing being known,

set

set the figure (which answer the question) in the *Quotient*; if it be a cipher (because the *Divisor* could not be had once in the upper figures) then cancel the whole *Divisor*, and not one of the upper figures, and remove it again towards the right hand (if you see any figure more of the *Dividend* untouched;) but if the figure (which answers the question) be significant, multiply the *Divisor* by this new figure, and subtract the *Product* in the same manner before taught, setting the rest above in its right place. If you see that there is still some figure of the *Dividend* untouched, remove the *Divisor* a place further, as before (that is, but one place at once further) until the *Unites* in the *Divisor* stand under the *Unites* of the *Dividend*.

5. When the *Divisor* ends with ciphers, do as followeth, for shortness sake.

If the *Divisor* consist of an *Unite* onely in the first place, towards the left hand, and nothing but ciphers towards the left, cut off so many places of the *Dividend* towards the right hand, as the *Divisor* hath ciphers; which figures so cut off, are the rest of the *Division*, as in the Fiftieth Example.

But if the *Divisor* consist of one or more significant figures, and nothing but ciphers towards the right hand, set down all the ciphers under the *Dividend* towards the right hand, and divide the remaining part of the *Dividend* (on the left hand) by the remaining part of the *Divisor* in the manner

manner before taught, as in the Fifty two Example.

6. If the *Divisor* be greater then the *Dividend*; observe, that such *Division* will produce a Fraction, and no whole number; which thing shall be explained in its proper place.

### *How to divide by one figure.*

#### 1. Example.

**I**F 8 be divided in two equal parts, what will each part be? *facit* 4.

Set the *Dividend* (8) first, and the *Divisor* (2) under, drawing a crooked line on the right side, as followeth.

Dividend 8 (  
Divisor 2

I see how many times the *Divisor* 2, is contained in the *Dividend* 8, I finde 4 times, therefore I set 4 in the crooked line, which is the place of the *Quotient*, thus.

8 (4  
2

Then I multiply the *Divisor* 2, by the *Quotient* 4, saying, 4 times 2 is 8; which 8 I subtract from 8 above, there remains nothing. But you must observe to prevent mistakes in great *Divisions*, that you do not forget to cancel your figures with

## Of Division.

111

with a dash of the Pen, as soon as you have made use of them: As in this first Example, as soon as I have set the 4 in the crooked line, I multiply the *Divisor* 2 by it, and in saying, [4 times 2 is 8] then presently I cancel the 2 thus 2; and having added these words [from 8] I cancel the 8 thus 8, and say, there remains nothing, thus.

Dividend 8 (4 Quotient.  
Divisor 2

### 2. Example.

In dividing 9 by 4, what is the *Quotient*? *sic*  
2, Rest 1.

9 (2  
4

I ask how many times 4 I can have in 9? the Answer of the Question is 2, which I set in the place of the *Quotient*; then in saying (in the same manner beforementioned) 2 times 4 is 8, I cancel 4 thus 4; and adding these words [from 9] I cancel 9 (thus 9,) and having said [there remains 1] I set down 1 above 9 so cancelled; and so the work is finished, as followeth.

(1 Rest.  
9 (2 Quotient, Rest 1.  
4

When.

When you have finished your *Division*, and finding any Remainder separate it from the figures, cancelled with a crooked line, as you see afore (which Rest must be always less then the *Divisor*) and set it in the *Quotient* above a little line thus ( $\frac{1}{4}$ ) and the *Divisor* under it thus ( $\frac{1}{4}$ ) which is a Fraction called a quarter, or a fourth. The whole *Quotient* of this second Example is then  $2\frac{1}{4}$ , which is two wholes and a quarter: But I shall trouble the Learner no further, concerning the name of the Number-Resting in any *Division*, until I come to treat of the Fractions (or broken numbers) I shall content my self to call such Resting-Number, *Remainder or Rest*.

Further, I shall adde a *Nota* by every variety, or change in the working of *Division*, to supply the brevity of the Rules before delivered; and also to remove the stumbling blocks, that the Learners usually meet withal in this part of *Arithmetick*, which is the great *Remora* that hath stayed many, and discouraged others from pursuing their intended course in this Noble Art of *Numbring*. Therefore I desire to be excused, if I repeat somethings already mentioned.

## 1 Note.

If the *Dividend* consist of more figures then one, and that the first figure (towards the left hand) be less then the first figure of the *Divisor* (towards the same hand) then set your *Divisor* a place further towards the right hand, as followeth.

3 Example.



3. Example.

In dividing 17 by 5, what is the *Quotient*?  
*facit* 3 $\frac{2}{5}$ .

$$\begin{array}{r} (2 \text{ Rest.} \\ 27 \text{ (} 3\frac{2}{5} \text{ Quotient.} \\ 5 \end{array}$$

I perceive that the first figure of the *Dividend* (towards the left hand) is but 1, and the *Divisor* is 5; therefore I place the said *Divisor* a place further, to wit, under 7, and I proceed as in the first and second Example.

4 Example.

If 8980 be divided into 4 parts, what will each part be? *facit* 2245.

2 Note.

Every Unite which is set above the *Dividend* as Rest, when another figure, or a cipher, is found on the right side thereof, is accounted for so many Tens; that is, if 1 remains, it is worth 10, if 2, 20, &c. as in the following Example.

$$\begin{array}{r} 8980 (2 \\ 44 \end{array}$$

I ask in 8, how many times 4, the Answer is 2, which 2 I set in the *Quotient*; then I multiply saying, 2 times 4 is 8, from 8 there remains  
1 nothing;

## Of Division.

nothing; then I remove the *Divisor* (4) a place further, as you see above, asking again, In 9 how many times 4? Answer, 2. I set 2 in the *Quotient* again, and multiply as before, saying, 2 times 4 is 8, from 9 there remains 1; which 1 I set above the 9, and remove the *Divisor* again, thus.

$$\begin{array}{r} 1 \\ 8980 \ 22 \\ 444 \end{array}$$

The 1 which remains (which must be joined to 8, the figure above the *Divisor* 4) is worth 10. Therefore I ask again in 18, how many times 4? Answer, 4, which I set for the third figure in the *Quotient*, and I multiply, saying, 4 times 4 is 16, from 18 there remains 2, which 2 I set above 8, having cancelled 18 first, and I remove the *Divisor* a place further, thus.

$$\begin{array}{r} 12 \\ 8980 \ 224 \\ 4444 \end{array}$$

The 2 which remains (according to the second *Note*) is 20. Now if the figure which is on the right side of the said 2, had been a Significant figure, as 4, I should have asked, in 24 how many times 4? but seeing that it is but a cipher, I say, in 20 how many times 4? Answer, 5, which 5 I set in the *Quotient*, for the fourth figure of it; and I multiply as before, saying, 5 times

4 is

## Of Division.

115

4 is 20, from 20 there remains nothing, the whole *Quotient* is 2245. as followeth.

$$\begin{array}{r} 22 \\ 8980 \text{ (2245 Quotient,} \\ 4444 \end{array}$$

### 5 Example.

Divide 18858 by 5, facit 3771 $\frac{3}{5}$ .

$$\begin{array}{r} 33(3 \\ 18858 \text{ (3771}\frac{3}{5} \text{ Quotient.} \\ 5555 \end{array}$$

6. *Item*, Divide 558 by 2, facit 279.
7. *Item*, Divide 558 by 3, facit 186.
8. *Item*, Divide 765 by 3, facit 255.
9. *Item*, Divide 988 by 4, facit 247.

### 3 Note.

If in dividing you finde that you cannot have the *Divisor* once, in some of the upper most figures (which are above it) then set a cipher in the *Quotient*, and cancel the *Divisor*, and remove it a place further, without cancelling any figure above it.

Further, having removed your *Divisor*, and if you finde still that you cannot have the said *Divisor* once in the figures which are above it, then set again a cipher in the *Quotient*, and cancel the *Divisor* as before, proceeding so until

I 2

your

## Of Division.

your *Divisor* comes to be set under some Significant figure, if there be any in the *D.vidend*; if not, the *Quotient* will end with ciphers, as in the Tenth and eleventh Example.

## 10 Example.

Divide 1500008 by 6, *facit* 250001 $\frac{2}{3}$ .

$$\begin{array}{r} 3 \\ 1500008 \ 250 \\ 666 \end{array}$$

Having set down the *Divisor* the third time, I finde but a cipher above it; now seeing I cannot have once 6 in nothing, I set a cipher in the *Quotient*, and cancel 6, the *Divisor* and the cipher above it (because there is no Significant figure uncanceled on the left side of the said cipher) and I remove the *Divisor* again thus.

$$\begin{array}{r} 3 \\ 1500008 \ 2500 \\ 6666 \end{array}$$

Having set the *Divisor* the fourth time, I perceive a cipher above it, as before; therefore I set a cipher in the *Quotient*, and cancelling the 6 and the cipher, I remove the *Divisor* the fourth time thus.

$$\begin{array}{r} 3 \\ 1500008 \ 25000 \\ 66666 \end{array}$$

Having

Having set the *Divisor* the fifth time (or removed it the fourth time) I perceive still a cipher above it; therefore I proceed as before, in setting a cipher in the *Quotient*, and cancel 6, and the cipher above it, and I remove the *Divisor* for the last time, thus.

$$\begin{array}{r} 3 \\ 1500008 \overline{) 250001} \\ 666666 \end{array}$$

Having removed the *Divisor* the fifth time, I perceive 8 to be above it; therefore I ask in 8, how many times 6? Answer, Once. I set 1 in the *Quotient*, and multiply as before, saying, once 6 is 6, from 8 there remains 2, which Rest I set above 8; the whole *Quotient* of this *Division* is  $250001\frac{1}{2}$ , as followeth.

$$\begin{array}{r} 3 \quad (2 \\ 1500008 \overline{) 250001\frac{1}{2}} \text{ Quotient.} \\ 666666 \end{array}$$

11 Example.

Divide 842400 by 6, facit 104400.

$$\begin{array}{r} 2 \\ 842400 \overline{) 140} \\ 666 \end{array}$$

Having set the *Divisor* (6) under the *Dividend* thrice (or removed the said *Divisor* twice) I finde it under 2: Now seeing I cannot have 6 in 2, I

I 3 set



# Of Division.

set a cipher in the *Quotient*, and cancel 6, and not the 2, because it is a Significant figure, which must be accounted for 20 when the *Divisor* is removed a place further, as followeth.

$$\begin{array}{r} 842400 \text{ (1404} \\ 6666 \end{array}$$

Having removed the *Divisor* the third time, I finde 24 to be above it; therefore I ask in 24, how many times 6? Answer, 4 times. I set 4 in the *Quotient*, and multiply, saying, 4 times 6 is 24, from 24 there remains nothing. I cancel first the 6, and then 24, and remove the *Divisor* further, thus.

$$\begin{array}{r} 2 \\ 842400 \text{ (1404} \\ 66666 \end{array}$$

I perceive that all the Significant figures of the *Dividend* are cancelled, and that ciphers onely remains; therefore I set so many ciphers in the *Quotient*, as the *Divisor* (6) can be placed under the *Dividend*, and the *Division* is finished as followeth.

$$\begin{array}{r} 2 \\ 842400 \text{ (140400 Quotient.} \\ 666666 \end{array}$$

12. Divide 76000 by 5, facit 15200.
13. Item, Divide 9864 by 8, facit 1233.
14. Item,



## of Division.

are two at the most.) Now the greatest difficulty in *Division* lieth in the answering of such Questions aright: For, sometimes (according as the figures are disposed) the right answer cannot be found without making some trial; whether the rest of the figures of the *Divisor* can be taken out of the upper figures (which are above them) as often as the first figure is; therefore the *Learner* must have an eye to the rest of the figures of the *Divisor* as well as to the first, and have also a special care to hit right the mark; that is, to take that figure (which is to be set in the *Quotient*) that answers the question, neither too great, nor too little; which thing may easily be discerned by these two following Observations.

1. Having set down the figure in the *Quotient* (which you judge will answer the question demanded) and multiplied all the figures of the *Divisor* (one after another) and subtract the *Products* from the upper figures: But if you finde that impossible to be done, that shews that the figure in the *Quotient* did not rightly answer the question, being too great, but must be lessened and put a lesser figure in the room of it, as in the Two and twentieth Example.

2. Having set the figure in the *Quotient* (which you judge will answer the question demanded) and multiplied and subtracted, as before. Observe, That the remaining figures (if there be any) which are above the *Divisor*, must be one of these three things, to wit, Equal with the *Divisor*,

*Divisor*, or else more or less in value, then the said *Divisor*. Now if the said Rest be equal or more, that shews that the figure set down in the *Quotient*, did not rightly answer the question, being too little, and must be increased or a greater put in the room of it, as in the said Two and twentieth Example.

Otherwise, if you finde after an exact *Multiplication* and *Subtraction* (as before) that the remaining figures be less in value then the *Divisor*, that shews that the figure placed in the *Quotient* did answer the question, and is neither too great or too little, as in the Two and twentieth Example following.

These two Observations being well understood and observed, the next thing to be known, is to subtract well the several *Products* arising from the *Multiplication* of the figures of the *Divisor*, multiplied by the figures in the *Quotient*, which thing shall be shewn in its place.

22 Example.

Divide 89 by 27, facit 3<sup>2</sup>.

$$\begin{array}{r} 89 \overline{) 3} \\ 27 \end{array}$$

I begin at the first figure of the *Divisor* (towards the left hand) saying, How many times 2 in 8, the right answer is 3 times; then I multiply, saying, 3 times 2 is 6; from 8 there remains 2, which

*of Division.*

2, which 2 I set above 8, having first cancelled 2 and 8 thus.

$$\begin{array}{r} 2 \\ 89 \overline{) 27} \end{array}$$

Now I go to the next figure of the *Divisor* 7, and multiply it by 3 (as I did the first) saying, 3 times 7 is 21, from 29 there remains 8; which 8 I set above 9, and having cancelled 7 and 29, the work is finished, the *Quotient* is then  $3\frac{8}{7}$  as followeth.

$$\begin{array}{r} 2(8 \\ 89 \overline{) 3\frac{8}{7}} \text{ Quotient.} \\ 27 \end{array}$$

Now to try the two Observations beforementioned (*Fol. 120.*) I shall repeat the foregoing Example over again, where I shall take the figure, in the *Quotient* too great, and then too little, that the *Learner* may perceive when he does work right, or not.

$$\begin{array}{r} 89 \overline{) 4} \\ 27 \end{array}$$

I ask in 8, how many times 2? the right answer is but 3, but I take 4, to see whether so much can be taken, or not: I multiply 2 by 4, saying, 4 times 2 is 8, from 8 there remains nothing: then I multiply the second figure of the *Divisor*, saying, 4 times 7 is 28, from 9 I cannot:



not: Therefore I conclude, that the figure 4 in the *Quotient* is too great.

Again, Instead of 4, I shall take but 2, to see whether 2 may be taken, or not.

$$\begin{array}{r} 4 \\ 89 \text{ (2} \\ 27 \end{array}$$

I ask in 8, how many times 2? I answer, but 2 (though 3 be the true answer) I set then 2 in the *Quotient*, and multiply, saying, 2 times 2 is 4, from 8 there remains 4, which 4 I set above 8, as you see above. Then I proceed and say, twice 7 is 14, which 14 must be subtracted from the figures above (which are 49) yet not at once, for that would be too difficult: Therefore I say, 14 from 9 that cannot be, I borrow 1 from the 4 above, which 1 is 10, and 9 is 19. Now 14 from 19, there remains 5; which 5 I set above the 9, and cancel the said 9, then I say further, 1 that I borrowed from 4, there remains 3, which 3 I set above 4, and cancel 4, as followeth.

$$\begin{array}{r} (3 \\ 45 \\ 89 \text{ (2 Rest 35.} \\ 27 \end{array}$$

Now seeing that the rest of this *Division* 35, exceeds the *Divisor*, which is but 27, I conclude that the figure in the *Quotient*, is too little, and that

that 3 may be taken instead thereof, as in Fol.

121.

23. Divide 140 by 19, *facit*  $7\frac{1}{2}$ .

24. *Item*, Divide 100 by 18, *facit*  $5\frac{1}{2}$ .

5 Note.

Though the *Divisor* contains never so many figures, there is always but a question and an answer to be made at the first figure thereof: For, the figure in the *Quotient* (which answers the question) will serve for all the other figures of the *Divisor*, and is the *Multiplier* of every figure of the said *Divisor*. Observe then for a general rule (when you see few, or many figures in the *Divisor*) that for every time that the *Divisor* is set down under the *Dividend*, so many questions you will meet (at the first figure towards the left hand of every *Divisor*,) and for every answer of such questions, one figure onely is to be set down in the *Quotient*.

This Observation ought to be well considered, for many will mistake in that very thing, when they come newly to divide with a great *Divisor*; therefore to put this needful observation into the *Learners* minde, I shall propound some *Divisions*, whose *Divisors* shall consist of 3. 4. 5. or more figures, and the *Quotients* of one figure onely, that they may perceive that one figure in the *Quotient* is sufficient for every *Divisor*, though never so great.

25. Divide

25. Divide 487 by 212, *facit*  $2\frac{63}{212}$ .

$$\begin{array}{r} 487(2 \quad (63 \\ 212 \quad 487(2\frac{63}{212} \text{ Quotient.} \\ \underline{212} \quad 212 \end{array}$$

I ask in 4, how many times 2? Answer 2, then I multiply, saying, 2 times 2 is 4, from 4 there remains nothing: Then again to the next figure, I say twice 1 is 2, from 8 there remains 6, which 6 I set above 8. Lastly, I say twice 2 is 4, from 7 there remains 3, which 3 I set above 7: The whole *Quotient* is onely 2, and the rest is 63.

26. Divide, 894 by 549, *facit*  $1\frac{345}{549}$ .

27. *Item*, Divide 4987 by 2343, *facit*  $2\frac{301}{2343}$ .

$$\begin{array}{r} 4987( \quad (301 \text{ Rest} \\ 2343 \quad 4987(2\frac{301}{2343} \text{ Quotient.} \\ \underline{2343} \quad 2343 \end{array}$$

6. Note.

When you finde no rest in *Subtracting* the *Product* of the figures of the *Divisor*, you must sometimes set a cipher above, and sometimes not. The rule to be observed is this, When you finde a figure uncanceled on the left hand (of that place where the *Subtraction* is made) then a cipher is to be set above that figure, from whence the *Subtraction* is made: But if you finde that all the figures resting on the left hand, are cancelled, then  
it

it is needless to set a cipher; as you may perceive by the foregoing Example.

I ask in 4, how many times 2? Answer 2; then I multiply, saying, twice 2 is 4, from 4 there remains nothing. Now observe, I do not set a cipher above the 4 (in the *Dividend*) because there is no figure on the left hand; then I proceed, saying, twice 3 is 6, from 9 there remains 3, which 3 I set above 9, and cancel 9. I say further, twice 4 is 8, from 8 there remains nothing. Now I set a cipher above 8, because I see the Significant figure 3, on the left hand uncanceled. Lastly, I say twice 3 is 6, from 7 there remains 1, which 1 I set above 7, and cancel 7: The *Quotient* is then  $2\frac{301}{2343}$ , as followeth.

$$\begin{array}{r} (301 \\ 4987 \quad (2\frac{301}{2343} \text{ Quotient.} \\ \underline{2343} \end{array}$$

## 7 Note.

Another thing to be observed in *Division*, is, how to *Subtract* the several *Products* (arising from the *Multiplication* of the figures of the *Divisor*) from the upper figures. This is performed divers ways; but I shall mention two onely, as followeth.

When you are to *Subtract* the *Product* of the first, second, and third figure, &c. of the *Divisor*. Observe, that such *Product* is to be taken from that figure, which is directly above that under

der figure so multiplied; and if thereremains any thing, set it above that figure: But the greatest difficulty lies in this, when the said *Product* is more then the said upper figure, in this case you must borrow from the upper figures towards the left hand, so many Unites as will just supply that want and no more; and every Unite so borrowed, must be accounted for 10. Now the Ten or tens so borrowed, and the figure above, being joyned together, subtract the said *Product* from that sum, setting the Rest (or a cipher, if nothing remains) above the said upper figure; and for every Ten so borrowed, subtract an Unite from the next figure towards the left hand, and set the Rest always above that figure that you do take from, as the following Example doth shew.

28. Divide 3556 by 1234, *facit*  $2\frac{1088}{1234}$ .

$$\begin{array}{r} \text{I} \\ 3556 \text{ (2} \\ \times 1234 \\ \hline \end{array}$$

I ask in 3, how many times 1? Answer, twice: I set 2 in the *Quotient*, then I multiply, saying, twice 1 is 2, from 3 there remains 1, which 1 I set above 3. Then I go to the next figure, saying, twice 2 is 4, from 5 there remains 1, which 1 I set above 5, as you see in the Margin.

$$\begin{array}{r} 11 \\ 3556 \text{ (2} \\ \times 1234 \end{array}$$

Further, I say twice 3 is 6, from 5 I cannot, therefore I borrow 1 from the next upper



# of Division.

upper figure, which is 10, and 5 is 15. Now 6 from 15, there remains 9, I cancel 5, and set 9 above it; then I say, that I borrow from 1, there remains nothing; I set a cipher above the 1 borrowed, as in the Margin.

0

129

3556 (2

1234

Littlely, I multiply the last figure of the *Divisor*, saying, twice 4 is 8, from 6 that cannot be; therefore I borrow 1 from the next upper figure 9, which 1 is 10, and 6 is 16. Now 8 from 16 there remains 8, which 8 I set above 6, and 1 that I borrowed from 9, there remains 8; which 8 I set above 9: The *Quotient* is then 2, and the Rest 1088, as in the Margin.

08

129|8

3556 (2<sup>1088</sup>

1234

## Another way.

There is another way, which differs but a little from this way, already mentioned. The difference is onely in the Subtracting, when you borrow any Tens from the upper figures. In the former way, you borrow so much as will serve to Subtract the whole *Product* of one figure at once. But in this way you do not Subtract so, but at twice (that is, if such *Product* consist of two figures) as the following Examples will plainly shew.

29. Divide

29. Divide 88125 by 18199 *facit* 4<sup>15325</sup><sub>18199</sub>.  
To shew the difference more evidently I shall  
work this Division these two several wayes.

The first vway first, then the second.

$$\begin{array}{r} 4 \\ 88125 \text{ (4} \\ 18199 \end{array}$$

I ask in 8 howv many times 1 ? Answer 4,  
(for 5 times is too much) then I multiply saying,  
4 times 1 is 4 from 8, there remains 4, vvhich  
4 I set above the 8, and cancel the 8, as you  
see above.

Then I go to the second figure of the *Divi-  
sor*, and say, 4 times 8 is 32, from 8, that can-  
not be; therefore I borrow from the next upper  
figure (4) so many tens as will suffice to be ad-  
ded to 8, that 32 might be subtracted. Now I  
see that 3 tens will serve; therefore I say, 30  
that I borrow, and 8 is 38, and 32 being taken  
from 38, rest 6, which 6 I set above 8, say-  
ing further, 3 that I borrowed from 4, there  
remains 1; vvhich 1 I set a-  
bove the 4, as in the Mar-  
gine.

Further, I go on to the third  
figure of the Divisor, saying 4  
times 1 is 4, from 1, that cannot be, I borrow  
onely 1 from the next upper figure (6) vvhich 1  
is 10. Novv 10 and 1 is 11, then 4 from 11,  
there

K

## Of Division.

$$\begin{array}{r} 15 \\ 467 \\ 88 \overline{) 25} (4 \\ \underline{x8x99} \end{array}$$
 there remains 7, vvhich 7 I set above 1, and 1 that I borrowd from 6, there remains 5, vvhich 5 I set above 6, as in the Margine I go further to the fourth figure of the *Divisor* 9; saying, 4 times 9 is 36, from 2, I cannot, I borrow 4 tens (from the next figure (7) vvhich is 40, and 2 is 42. Now 36 from 42, rest 6, vvhich 6 I set above 2, and 4 I borrowd from 7, there remains 3, vvhich 3 I set above the 7, as in the Margin. Lastly, I go to the last figure of the *Divisor* 9; saying, 4 times 9 is 36, from 5, that cannot be, I borrow 4 as before (from the next upper figure) vvhich is 40, and 5 is 45. Now 36 from 45, there remains 9, vvhich 9 I set above the 5, and 4 that I borrowd from 6, there remains 2, vvhich 2 I set above 6, the *Quotient* is then 4, and the rest is 15329, as in the Margin.

$$\begin{array}{r} 1532 \\ 4676 \overline{) 9} \\ 88 \overline{) 25} (4 \quad \begin{smallmatrix} 15329 \\ 12199 \end{smallmatrix} \\ \underline{x8x99} \end{array}$$

*The same another way.*

$$\begin{array}{r} 4 \\ 88 \overline{) 25} (4 \\ \underline{x8199} \end{array}$$

I ask (as before) in 8 howv many times 1?  
**Answer**

## Of Division.

131

Answer 4 times, then 4 times 1 is 4, from 8, there remains 4. Which 4 I set above 8, as you see above. I go to the second figure, saying 4 times 8 is 32. Now observe here, instead of borrowing 3 tens as before. I subtract the product (32) at two several times, taking first the unites (2) then the tens (3) saying, 2 from 8, there remains 6, which I set above the 8, then 3 from 4, there remains 1, which 1 I set above 4, as in the Margin.

1  
46  
88125 ( 4

I go next to the third figure of the *Divisor*, saying, 4 times 1 is 4, from 1, that cannot be, I borrow 1 which is 10, and 1 is 11. Now 4 from 11, there remains 7, which 7 I set above 1, and 1 that I borrowed from 6, there remains 5, which 5 I set above 6, as in the Margin.

15  
467  
88125 ( 4  
18199

I proceed to the fourth figure 9, saying, 4 times 9 is 36. Now 6 from 2, that cannot be, I borrow 1 (from the 7) which is 10, and 2 is 12; then I say 6 from 12, there remains 6, which 6 I set above 2. Now 1 that I have borrowed, and 3 is 4, from 7, there remains 3, which 3 I set above the 7, as you may see in the Margin.

153  
4676  
88125 ( 4  
18199

Lastly, I say 4 times 9 is 36. Now 6 from 5, that cannot be, but 6 from 15, there remains

K 2

91

## Of Division.

9, vvhich 9 I set above 5, and 1 that I borrowed and 3 is 4, from 6, there remains 2, which 2 I set above 6, the *Quotient* is then  $4\overset{15329}{18159}$ , as followvs.

$$\begin{array}{r} 1532 \\ 4676 \overline{) 88125} \\ \underline{18159} \end{array} \quad (4\overset{15329}{18159} \text{ Quotient.}$$

Of these two manner of wayes (of Subtracting the products of the several figures of the *Divisor*) the Learner may choose which he please. But I shall of those two wayes choose the first, in the following Divisions.

Before I propound any Divisions which have more figures in the *Quotient* then one, I shall add here two or three Divisions more, to make the Learner the more perfect in subtracting the several products of the figures of the *Divisor*.

30. Divide 31867 by 13619, *facit*  $2\overset{4529}{13619}$ .

31. Divide 830072 by 309007 *facit*  $2\overset{212058}{309007}$ .

## 8 Note.

When the *Divisor* consists of significant figures which have ciphers between them, then cancel onely the ciphers of the said *Divisor*, and not any figure above them, and subtract the products of the significant figures of the said *Divisor* from the figures of the *Dividend*, as before, thus,

I ask



$$\begin{array}{r} 2 \\ 8 \overline{) 30072} ( 2 \\ \underline{309007} \end{array}$$

I ask in 8 how many times 3? Answer 2, then I set 2 in the *Quotient*, and multiply as before; saying, twice 3 is 6 from 8, there remains 2, then twice nothing is nothing. I cancel the cipher in the *Divisor*, but not the 3 which is above it; then twice 9 is 18, from 0, that cannot be, but from 20 (for I borrow 2 tens) there remains 2. Now 2 that I borrowed, from 3, there remains 1, which 1 I set above 3, as in the Margin.

$$\begin{array}{r} 212 \\ 8 \overline{) 30072} ( 2 \\ \underline{309007} \end{array}$$

I proceed to the two ciphers in the *Divisor*, saying, twice nothing is nothing; and again, twice nothing is nothing, cancelling the ciphers as I go along, as you see in the Margin.

$$\begin{array}{r} 212 \\ 8 \overline{) 30072} ( 2 \\ \underline{309007} \end{array}$$

Lastly, I say twice 7 is 14, from 2, that cannot be, but from 22 there remains 8, and 2 that I borrowed from 7, there remains 5, which 5 I set above 7, the *Quotient* is  $2\overset{21}{3}\overset{21}{5}\overset{21}{8}\overset{21}{0}\overset{21}{7}$ , as followeth.



which is to remove it a place further (every time) towards the right hand in the manner following.

33. Divide 5964 by 21, *facit* 284.

$$\begin{array}{r} 1 \\ 5964 \overline{) 2} \\ 21 \end{array}$$

I ask in 5 how many times 2? Answer twice, I set 2 in the *Quotient*, and multiply as before; saying twice 2 is 4, from 5, there remains 1, which 1 I set above 5, as you may see before.

Then I go to the second figure

of the *Divisor* 1, saying, 17

twice 1 is 2, from 9, there re- 5964(2

mains 7, which 7 set above 9, 21

as in the Margin. Now in the

removing of the *Divisor*, I set the 1 under 6,

and the 2 under the 1: Then I see what figures

I have above 2 (the first figure

of the *Divisor* on the left 17

hand.) And I finde 17, then 5964(2

I ask in 17 how many times 21

2? Answer 8: I set 8 in 2

the *Quotient*, and multiply,

saying, 8 times 2 is 16, 1

from 17, there remains 1, 178

which 1 I set above 7. Fur- 5964(28

ther I say 8 times 1 is 8, 211

from 6, that cannot be, but 2

from 16, there remains 8,

K 4

which

# Of Division.

vvhich 8 I set above 6, as in the Margin. I remove the *Divisor* a figure further, setting the 1 under 4, and the 2 under the 1, vvhich is cancelled, as you see in the Margin. Then I see vvhhat figure there is above the 2 (the first figure of the *Di-*

*visor*) I finde onely 8, then I ask in 8 how many times 2? Answer 4. I set 4 in the *Quotient*, as you see in the Margin, then I multiply as before, saying 4 times 2 is 8, from 8 (vvhich is right above the 2) there remains nothing; then last of all I say 4 times 1 is 4 from 4, there remains nothing, as followveth.

x  
178  
5964 ( 284  
2221  
22

x  
178  
5964 ( 284 *Quotient.*  
2222  
22

*Here followeth some Divisions by two figures for the exercise of the Learner.*

34. Divide 44880 by 12, *facit* 3740.
35. *Item*, Divide 65982 by 14, *facit* 4713.
36. *Item*, Divide 111616 by 16, *facit* 6976.
37. *Item*, Divide 21418 by 27, *facit* 793<sup>7</sup>.
38. *Item*, Divide 1142812 by 19, *facit* 60148.

39. *Item*,

39. *Item*, Divide 42826 by 49, *facit* 874.
40. *Item*, Divide 33644 by 52, *facit* 647.
41. *Item*, Divide 10476 by 65, *facit* 161 $\frac{11}{65}$ .
42. *Item*, Divide 607446 by 63, *facit* 9642.
43. *Item*, Divide 957972 by 97, *facit* 9876.

10. *Note.*

When you are to remove your *Divisor* divers times, consisting of three, four, five, or more figures, take good heed of mistaking the right places of the figures of the *Divisor*; therefore, Observe that each figure of the *Divisor* be removed a place further towards the right hand, in such manner, that the *Unites* of the said *Divisor* be alwayes the very next figure under each figure of the *Dividend*, and the other figures in their right order as followeth.

• Suppose that 348648340 were to be divided by 31452. In removing such great *Divisor*, observe well the order following, vvhich may serve as an example for the rest.

*The first setting of the Divisor.*

348648340(  
31452

*The first removing.*

348648340(  
314522  
3145

*Second*



*Second removing.*

$$\begin{array}{r}
 348648340( \\
 3145222 \\
 31455 \\
 314
 \end{array}$$
*Third removing.*

$$\begin{array}{r}
 348648340( \\
 31452222 \\
 314555 \\
 3144 \\
 31
 \end{array}$$
*Fourth removing.*

$$\begin{array}{r}
 348648340( \\
 314522222 \\
 3145555 \\
 31444 \\
 311 \\
 3
 \end{array}$$

The Learner being thus acquainted with all the difficulties of this kind of Division, I shall (before I conclude) add some examples more for exercise, and for the better remembrance of what hath been said before. Contenting my self to set down onely the work, without further directions.

44. Divide 2888532 by 618, *facit* 4674.

The

The work of the first  
figure in the  
Quotient.

1  
446  
2888532 (4  
618

The work of the se-  
cond figure.

4  
55  
100  
4467  
2888532 (46  
6188  
61

The third work.

2  
43  
554  
100  
44677  
2888532 (467  
61888  
611  
6

The work of the fourth  
figure.

2  
43  
554  
1003  
44677  
2888532 (4674  
618888 Quotient.  
6111  
66

45. Item, Divide 587358 by 894, facit 657.

46. Item, Divide 40877 by 301, facit

135<sup>242</sup><sub>301</sub>.

47. Item, Divide 588392 by 6004, facit 98.

48. Item, Divide 300111 by 5007, facit

59<sup>4698</sup><sub>5007</sub>

49. Item,

## Of Division.

49. Item, Divide 4000110 by 6009, *facit*  
 $665^{\frac{4125}{6009}}$ .

$$\begin{array}{r}
 33 \quad 12 \\
 49 \overline{) 47715} \\
 4000110 \quad (665^{\frac{4125}{6009}} \text{ Quotient.} \\
 600999 \\
 6000 \\
 60
 \end{array}$$

## II. Note.

When the Divisor consists of an Unite in the first place towards the left hand, and nothing but ciphers towards the right: It is needlesse to place the ciphers as the significant figures are, though the *Quotient* comes right that way as well as the other, but it is too tedious and altogether needlesse, as shall appear hereafter, *fol.* 141.

In such a case then, the best way is to cut off so many places of the *Dividend* towards the right hand, as the *Divisor* hath ciphers, and those figures so cut off, is the rest of such Division, as followeth.

50. Divide 163499 by 10, *facit* 16349.

$$16349 \overline{) 9}, \text{ facit } 16349. \text{ Quotient.}$$

For the cipher which is in the *Divisor* towards the right hand, I cut off the first figure of the *Dividend* towards the same hand, the *Quotient* is 16349, and the rest is 9.

If the said *Dividend* were to be divided by 100, then two figures are to be cut off thus, 1634|99: If by 1000, then three figures must be cut off thus, 163|499, &c.

Now, to shew and satisfy the Learners (for some will not go out of the common road, before they be satisfied of a shorter way as true as the other) that this way is far shorter then to remove every cipher, as the significant figures I shall here insert both wayes, and then let them judge.

51. Divide 451346000 by 1000, *facit* 451346.

. 451346.000, *facit* 451346.

*Otherwise, more tedious.*

451346000 (*451346 Quotient.*  
 100000000  
 1000000  
 100000  
 111

Though some may judge this trouble needlesse to insert such Division here; yet I say, that though this be so, to those that are taught already, nevertheless that may give some satisfaction to the unlearned. And this Book is chiefly for the weaker sort, and therefore the plainer, the better. It is a good fault (if it may be called a fault) in any Writer to be plain in what he  
 treats

treats of, especially if it be of this or such like Art.

## 12. Note.

When the *Divisor* consists of one or more significant figures towards the left hand, and nothing but ciphers towards the right, then set down all the ciphers under the *Dividend* on the right hand, and divide the remaining part of the *Dividend* on the left hand, by the remaining part of the *Divisor*, as followeth.

52. Divide 434120 by 4000, *facit*  $108\frac{3120}{4000}$ .

$$\begin{array}{r} 12 \\ 434\overline{)120} \quad (108\frac{3120}{4000} \text{ Quotient.} \\ 444000 \end{array}$$

The three ciphers are placed so under the *Dividend*, for shortnesse sake, as is said before.

53. Divide 116840670 by 301000, *facit*  $388\frac{52670}{301000}$ .

54. *Item*, Divide 10101010 by 4019, *facit*  $2513\frac{1263}{4019}$ .

55. *Item*, Divide 822368178 by 9637, *facit* 84894.

56. *Item*, Divide 519603282 by 7641, *facit* 68002.

57. *Item*, Divide 8460476 by 68478, *facit*  $123\frac{3782}{68478}$ .

58. *Item*,



## Of Division.

143

58. *Item*, Divide 184064876 by 836846,  
*facit* 219, the rest or remainder is 795602.

59. *Item*, Divide 3600001080000081 by  
 60000009, *facit* 60000009.

60. *Item*, Divide 678967896789678 by  
 56785678, *facit* 11956675<sup>289018</sup><sub>3878378</sub>.

I have been the larger in *Division*, because that  
 it is that part of *Arithmetick* which is most dif-  
 ficult for young beginners.

## Another way of Division.

THE other way of *Division*, which I intend  
 (God willing) to describe here, differs not  
 much from the former, onely it performes *Di-*  
*vision* with fewer figures then the other; there-  
 fore to avoid needlesse repetitions, I shall lay  
 down the difference in few words, for all the  
 observations of the first way (concerning the pla-  
 cing of the *Dividend* and *Divisor*, and also the  
 removing of it, &c.) are to be observed in this  
 second, except when you multiply the *Divisor*  
 by the *Quotient*, then you do otherwise as fol-  
 loweth.

First, Having placed the *Divisor* under the  
*Dividend*. In the first way, you begin to mul-  
 tiply the first figure of the *Divisor* on the left  
 hand, and so proceed towards the right: But in  
 this

this second way of *Division* you must begin quite contrary; that is, you are to begin on the first figure of the *Divisor* on the right hand, and proceed towards the left.

Secondly, In subtracting the products of the *Divisor*, in the first way, If you borrow any Unites (to help the Subtraction) then you subtract them presently from that figure from whence it was borrowed (or from the next, &c.) and you set the rest over it, before you multiply another figure of the *Divisor*, which way makes the number of figures the greater. But in this Second way, observe that when you borrow any Unites to supply the place of tens (or to help the Subtraction) after you have set down the rest of such Subtraction, you must not subtract alone the Unites (or tens) so borrowed (as in the former way) but you are to keep them in minde, then go on and multiply the next figure of the *Divisor* (by the figure in the *Quotient*) and add so many unites as you did keep in minde, to the product of that multiplication, and subtract that sum from your *Dividend*, going towards the left hand. If you see occasion to borrow, do as you did before, keeping alwayes in minde what you borrow, to be added to the product of the *Multiplication* of the next figure of the *Divisor* (towards the left hand) as the following examples will plainly shew.

1 Example.

I Example.

In dividing 7548 by 76, what is the *Quotient*?  
*facit* 99<sup>24</sup><sub>72</sub>.

I set the *Divisor* under the *Dividend* as formerly, thus.

$$\begin{array}{r} 7548(9 \\ 76 \end{array}$$

I ask in 75 how many times 7? Answer, 9 times. Now instead of saying (as before) 9 times 7. I say 9 times 6 is 54, from 4 (which is above 6) that cannot, I borrow 5 (which is 50) and 4 is 54. Now 54 from 54, there remains nothing. I set a cipher above 4, and keep 5 in minde, that I borrowed; then

I multiply the next figure of the *Divisor*, saying, 9 times 7 is 63, and 5 that I borrowed (which I kept in minde) is 68. Now 68 from 5 (which is above 7) that cannot be, therefore I borrow the next figure 7 which is 70, and 5 is 75.

Now 68 from 75 there remains 7, which 7 I set above 5, as you see here in the Margin, I remove the *Divisor*, and ask in

$$\begin{array}{r} 0 \\ 7548(9 \\ 76 \end{array}$$

$$\begin{array}{r} 70 \\ 7548(9 \\ 766 \\ 7 \end{array}$$

70 how many times 7? Answer, 9 times. I set 9 in the *Quotient* and multiply, saying, 9 times 6 is 54, from 8 that cannot be, I borrow 5 (or 50) and 8 is 58. Now 54 from 58 there remains 4,

L

which

## Of Division.

$$\begin{array}{r}
 704 \\
 7548 \overline{) 99} \\
 \underline{766} \\
 7
 \end{array}$$

which 4 I set above 8, and carry 5 in minde, as in the Margin, I proceed and say, 9 times 7 is 63, and 5 I kept in minde, is 68, from 0 that cannot be, but from 70 (for I borrow 7 tens) there remains 2, which 2 I set above the cipher, as followeth.

$$\begin{array}{r}
 12 \\
 70 \overline{) 4} \\
 7548 \overline{) 99} \frac{24}{7} \text{ Quotient.} \\
 \underline{766} \\
 7
 \end{array}$$

## 13 Note.

When you are to borrow any Unites from the upper figures towards the left hand (to help the *Substraction* of the *Products* of any of the figures of the *Divisor*) you need not to trouble your self (either in this way of *Division*, or in the former) to consider, whether the figure, from whence you are to borrow, be a significant figure (great enough to borrow as much as you need) or not, because you pay the debt by adding so many tens that you bear in minde to the *Product* of the *Multiplication* of the next figure, to be subtracted again. But if it be demanded, where I must borrow, if the place (or figure) from whence a supply must be borrowed, be but a cipher, and the next figure a cipher also: I answer, that I borrow then from the

the third, fourth, or fifth figure, or I borrow from the next significant figure (whether it be in the third, fourth, or fifth place, &c.) which is alone. But this is needless to enquire, because (as is said before) that which is borrowed, is repaid in adding it to the *Product* of the *Multiplication* of the next figure of the *Divisor*.

2 Example.

Divide 64284 by 487, facit 132.

$$\begin{array}{r} 5 \\ 64284 \overline{) 1} \\ 487 \end{array}$$

I ask in 6, how many times 4? Answer 1, then I multiply, saying, once 7 is 7, from 2 I cannot, but from 12 there remains 5, which 5 I set above the 2, and bear 1 in minde; then I say once 8 is 8, and 1 I kept in minde, is 9: Now 9 from 4 I cannot, but 9 from 14 there remains 5, which 5 I set above 4, and bear 1 in minde again. Further I say, once 4 is 4, and 1 (I kept in minde) is 5, from 6 there remains 1, which 1 I set above 6 as in the Margin. I remove the *Divisor*, and ask in 15 how many times 4? Answer, 3 times, I set 3 in the *Quotient*, and say, 3

$$\begin{array}{r} 55 \\ 642 \overline{) 4} \overline{) 1} \\ 487 \end{array}$$

$$\begin{array}{r} 155 \\ 64284 \overline{) 13} \\ 4877 \\ 48 \end{array}$$

L 2

times



## of Division.

times 7 is 21, from 8 I cannot; but from 28 there remains 7, and bears 2 in minde; which 7

$$\begin{array}{r} 1557 \\ 64284 \text{ (13} \\ 4877 \\ 48 \end{array}$$

$$\begin{array}{r} 9 \\ 1557 \\ 64284 \text{ (13} \\ 48777 \\ 488 \\ 4 \end{array}$$

$$\begin{array}{r} 9 \\ 1557 \\ 64284 \text{ (132} \\ 48777 \\ 488 \\ 4 \end{array}$$

$$\begin{array}{r} 9 \\ 1557 \\ 64284 \text{ (132} \\ 48777 \\ 488 \\ 4 \end{array}$$

I set above 8, as in the Margin. Then I say, thrice 8 is 24, and 2 I kept in minde is 26; from 5 I cannot, but from 35 there remains 9, which 9 I set above 5, and bear 3 in minde; then I say further, thrice 4 is 12, and 3 is 15. Now 15 from 15, there remains nothing, I cancel 15, and remove the *Divisor*, as in the Margin. I ask again in 9, how many times 4? Answer 2; then having set 2 in the *Quotient*, I say twice 7 is 14, from 4 I cannot, but from 14 there remains nothing, I cancel 7 and 4, and bear 1 in minde. I say further, twice 8 is 16, and 1 is 17, from 7 I cannot, but from 17 there remains nothing. I cancel 8 and 7, and bear 1 in minde. Lastly, I say twice 4 is 8, and 1 is nine, from 9 there remains nothing, the *Quotient* is 132, as in the Margin.

3 Example.

3. Example.

Divide 29999100006 by 99999, facit  
299994.

39999  
299999100006 (299994 Quotient,  
9999999999  
999999999  
999999  
9999  
99

Here followeth the same Division wrought the  
first way, to shew the Learner what quantity of  
figures one way hath more then the other.

13  
94  
1023  
9839  
0940  
180283  
998399  
009400  
13802883  
99983999  
000928883  
1111139999  
299999100006 (299994 Quotient.  
9999999999  
99999999  
999999  
9999  
99

## The Proof of Division.

**D**ivision may be proved in casting away all the nines, as in *Multiplication*, but the uncertainty of it makes me to omit it: The best and most certain Proof of *Division*, is done by *Multiplication*, and contrariwise, the best Proof of *Multiplication* is done by *Division*. Therefore I shall mention here how to prove these two Rules, seeing that the one proves the other.

*Division* is proved thus, Multiply the *Quotient* by the *Divisor*, and the *Product* must be equal with the *Dividend*, if there be no Rest in the *Division*; but if you finde a Rest, adde it to the *Product* of the *Multiplication*, and the sum shall be equal to the *Dividend*; which proves the *Division* to be right, as followeth.

Divide 873423 by 123, facit 7101.

$$\begin{array}{r}
 \text{xx} \\
 873423 \text{ (7101 Quotient.} \\
 \text{xx} \text{ } 123 \text{ Divisor.} \\
 \text{xx} \text{ } \text{---} \\
 \text{xx} \quad 21303 \\
 \quad 14202 \\
 \quad 7101 \\
 \quad \text{---}
 \end{array}$$

*Proof*—873423

But finding a Rest in the *Division*, do as in the following Example.

Divide

# Of Division.

151

Divide 4437 by 37, *facit* 119<sup>34</sup>.

$$\begin{array}{r}
 3\overline{)4437} \\
 \underline{764} \phantom{00} \\
 4437 \phantom{00} \text{ (119<sup>34</sup> Reft Divisor)} \\
 \underline{3777} \phantom{00} 37 \\
 37 \phantom{00} \underline{\phantom{00}} \\
 833 \phantom{00} \\
 357
 \end{array}$$

Add the Rest—34

*Proof*—4437

*Multiplication* is proved thus. Divide the *Product* by the *Multiplier*, and the *Quotient* will be equal to the *Multiplicand*, as followeth.

Multiply 595 by 47, *facit* 27965.

$$\begin{array}{r}
 595 \text{ *Multiplicand.*} \\
 47 \text{ *Multiplier.*} \\
 \hline
 4165 \phantom{00} 2 \\
 2380 \phantom{00} 443 \\
 \hline
 27965 \text{ *Product.*} \phantom{00} 4777 \text{ *Proof.*}
 \end{array}$$

*Otherwise.*

Divide the *Product* by the *Multiplicand*, and the *Quotient* will be equal to the *Multiplier*, as followeth.

$$\begin{array}{r}
 47 \\
 27965 \text{ (47 *Quotient*, which is equal with} \\
 5955 \phantom{00} \text{the *Multiplier* of the said} \\
 59 \text{ *Proof.* *Multiplication.*}
 \end{array}$$

L 4

*Questions*

## Questions of Division.

Quest. 1. **W**hat is Division?

*Ans.* Division is the separating of any number into any equal parts assigned, or to finde how many times one number is contained in another.

Quest. 2. How many Numbers hath Division?

*Ans.* There are chiefly three Numbers in any Division.

Quest. 3. Which are they?

*Ans.* The Dividend, the Divisor, and the Quotient.

Quest. 4. Is there always but three Numbers in any Division?

*Ans.* There are sometimes four.

Quest. 5. Which is the fourth?

*Ans.* The Remainder or Rest.

Quest. 6. What Number is it you call the Dividend?

*Ans.* The Dividend is the Number to be divided.

Quest. 7. What is the Divisor?

*Ans.* The Divisor is the Number by which the Dividend is divided.

Quest. 8. What is the Quotient?

*Ans.* The Quotient is the Number produced by Division.

Quest. 9. What doth the Quotient shew?

*Ans.*



*Answ.* The *Quotient* shews how often the *Divisor* is contained in the *Dividend*.

*Quest. 10.* What is the Number you call *Remainder*?

*Answ.* The *Remainder* is, when any Number remains, when the *Division* is finished.

*Quest. 11.* How comes that to pass, that some *Divisions* have a *Rest*, and some other have none?

*Answ.* Before I answer your question, I shall tell you first, that in a *Division* without *Rest*, the *Quotient* contains just so many *Unites*, as the *Divisor* is contained in the *Dividend*.

*Quest. 12.* What's the reason of the *Rest* then?

*Answ.* When the *Dividend* doth not contain the *Divisor*, a just quantity of whole *Unites*, then there is a *Rest* besides the *Quotient*, which *Rest* is a part of an *Unit*.

*Quest. 13.* Explain your meaning by an *Example*?

*Answ.* Suppose that 8 be given to be divided by 2. I ask thus; in 8 how many times 2? the answer is 4. Now this 4 is the *Quotient*, which shews that the *Divisor* 2, is contained just 4 times in the *Dividend* 8.

*Quest. 14.* Give another *Example* where there is a *Rest*?

*Answ.* Suppose that 9 be given to be divided by 2. I say as before, in 9 how many times 2? the answer is 4, for the *Quotient*, and there is 1 over; which 1 is the *Remainder* of that *Division*, and is to be divided into two parts; now each part is a half, the whole *Quotient* is then  
4 whole

4 whole Unites, and a half of an Unite, or 1.

Quest. 15. *How do you divide one Number by another?*

Ans. I set down first the *Dividend*, then the *Divisor* under it.

Quest. 16. *In what manner?*

Ans. I set the *Divisor* under the *Dividend*, on the left hand each figure of one Number directly under the figures of the other.

Quest. 17. *Is that a general rule, to set the first figure of each Number (towards the left hand) under one another, and the second under the second, &c?*

Ans. No.

Quest. 18. *What rule have you to place your Divisor to prevent mistakes?*

Ans. If the *Divisor* consist of one figure onely, I consider whether that figure be equal or lesser then the first figure of the *Dividend* towards the left hand.

Quest. 19. *What then?*

Ans. If that figure (which is the *Divisor*) be equal or lesser then the first figure of the *Dividend*, then I set it down under it.

Quest. 20. *But if the first figure of the Dividend (towards the left hand) be less then your Divisor?*

Ans. In such a case I set down the *Divisor*, not under the first figure, but under the second.

Quest. 21. *What if the Divisor consist of more figures then one, as 2, 3, 4, 5, &c?*

Ans. I must observe, whether such great  
Divisor

*Divisor* can be found once at least in the like quantity of figures of the *Dividend*, towards the left hand.

Quest. 22. *Grant it be so; what then?*

*Ans.* If so, then I set down the first figure under the first, the second under the second, &c.

Quest. 23. *But suppose it be otherwise, how will you place your Divisor?*

*Ans.* I should set the *Divisor* a place further, towards the right hand, thus; the first figure of the *Divisor* under the second figure of the *Dividend*, and so the rest of the figures of the *Divisor* in order.

Quest. 24. *But what is to be done, if you could not remove the Divisor a place further?*

*Ans.* Then I should conclude, that the *Quotient* of such *Division* could not amount to an *Unite*, but onely to a *Fraction*, or a part of an *Unite*.

Quest. 25. *How do you know when a Divisor can be removed, and when not?*

*Ans.* The *Divisor* being rightly placed under the *Dividend*, I see whether the said *Divisor* fills up all the places of the *Dividend* (towards the right hand) or not.

Quest. 26. *What do you mean by filling up?*

*Ans.* My meaning is, whether every figure of the *Dividend* hath a figure of the *Divisor* under it, in such manner, that the *Unites* of the *Divisor* be right under the *Unites* of the *Dividend*.

Quest. 27. *Suppose it be so filled up?*

*Ans.*

*Answ.* If so, then I conclude, that the *Quotient* must consist of one figure onely.

*Quest.* 28. Can you perceive how many figures the *Quotient* will consist, before the *Division* be finished?

*Answ.* Yes; but yet, though I know the quantity of the figures, I cannot tell what particular figure they shall be.

*Quest.* 29. How do you know the quantity of the figures that will be in the *Quotient*, before you divide?

*Answ.* Having set down the *Divisor* the first time, I see how many figures in the *Dividend* (towards the right hand) I finde that have no figure under them.

*Quest.* 30. What then?

*Answ.* Then so many figures as I finde (towards the right hand) in the *Dividend* that have no figures under them, so many figures must be in the *Quotient*, besides that figure that will answer the question of the *Divisor* already set down.

*Quest.* 31. Your meaning is, That having set down the *Divisor* under the *Dividend*, and finding four figures (in the said *Dividend* on the right hand) that are all one (or that have no figures under them) that the *Quotient* must consist of five figures, is it not?

*Answ.* You have it right.

*Quest.* 32. How come you to know every particular figure in the *Quotient*?

*Ans.* By dividing the *Dividend* by the *Divisor*.  
*Quest.*

Quest. 33. *Which way?*

Ans. There are diversity of Operations, to finde the *Quotient* of a *Division*.

Quest. 34. *Which way do you think the best?*

Ans. I cannot well answer your question, onely by the common Proverb, *So many men, so many mindes*; for, that way which one judges the best, another rejects; every one thinks his way the best.

Quest. 35. *What is the way that you make use of?*

Ans. I make use of two several ways, sometimes one, sometimes another; but yet I judge the shortest way to be the best.

Quest. 36. *Speak of them in order.*

Ans. I shall then begin with the first way, which requires more figures in the Operation of it, then the other, which way is very common.

Quest. 37. *Go on and begin with that which is the easiest first.*

Ans. I shall make it as plain as I can, and begin with those *Divisions*, whose *Dividend* and *Divisor* consists both of a single figure.

Quest. 38. *Having set down your two numbers, to wit, your Dividend and Divisor, how do you divide?*

Ans. I ask how many times the *Divisor* is contained in the *Dividend*: Now observe, that figure which answers the question, I set it in the *Quotient*.

Quest. 39. *Give an Example to make that plain.*

Ans.



*Ans.* If 8 be given to be divided by 4. I set 4 under 8, and ask, in 8 how many times 4; the answer is 2: Now this 2 I set in a crooked line on the right side of the *Dividend*, thus,

$$8(2$$

$$4$$

Quest. 40. *What do you do with the 2 in the Quotient?*

*Ans.* I multiply the *Divisor* 4, by the *Quotient* 2, saying, twice 4 is 8, which 8 I subtract from the *Dividend* 8, saying, 8 from 8, there remains nothing; and so the *Division* is finished, the *Quotient* is 2. And I cancel 8 and 4 thus, 8, 4.

Quest. 41. *If you finde any Rest in the Division, what must you do with it?*

*Ans.* If I finde any Rest in a *Division*, I separate it with a crooked line from the figures which are cancelled, as thus, If 9 be divided by 4, the Rest will be 1, which 1 I separate with a crooked line thus.

$$\{1$$

$$9(2$$

$$4$$

Quest. 42. *Why do you cross or cancel the figures that you have used?*

*Ans.* I cancel every figure used, for fear of mistakes.

Quest. 43. *How can you mistake, if the figures remain uncanceled?*

*Ans.* It may happen in not cancelling the figures

figures used, that I may forget, and so make use of some of them twice, when once is enough; and so get a false *Quotient*, or a false *Remainder*.

Quest. 44. *When must you cancel them?*

Ans. I must cancel them as soon as ever I have done with them.

Quest. 45. *How?*

Ans. As in the foregoing example, when I did divide 9 by 4, as soon as I have spoken these words [*twice 4 is 8*] I cancel 4, and saying further, *from 9 I cancel 9*, and adding these words [*there remains 1*] I set 1 above 9, and separate it with a crooked line, as you see before under the answer of the 41 Question.

Quest. 46. *What is that 1 worth that remains.*

Ans. The 1 remaining is a part of one, of the Unites in the *Quotient*.

Quest. 47. *How do you call that part?*

Ans. It is a quarter, because I did divide by 4.

Quest. 48. *How do you prove that?*

Ans. The 1 remaining, must be divided by 4, and if a whole be divided into 4 parts, each part will be a quarter.

Quest. 49. *I understand your meaning, but is not the said Rest called a Fraction?*

Ans. Yes; therefore we will reserve to speak of it in its proper place, that is, when we come to the Fractions.

Quest. 50. *But before we leave to speak of the Rest of Division, is there nothing to be observed of it?*

Ans.

## of Division.

*Ans.* Yes ; for the *Division* (great or small) being finished, you must observe, that the *Rest* ought always to be lesser then the *Divisor*.

*Quest.* 51. *What if the Remainder were either equal or greater then the Divisor ?*

*Ans.* If so, it is a sign that the figure in the *Quotient* did not rightly answer the question, and is too little, and might be an unite (or more) greater then it is.

*Quest.* 52. *This is worth observation ; but how shall I know when I take such figure (in the Quotient) too great ?*

*Ans.* This is easier to be discerned then the former.

*Quest.* 53. *Which way ?*

*Ans.* When you come to multiply that figure (in the *Quotient*) with the *Divisor* ; if the *Product* cannot be subtracted from that figure or figures, which are above the said *Divisor*, that shews that such figure (in the *Quotient*) is too great.

*Quest.* 54. *I perceive now, that when a figure in the Quotient is too great, then the working is quite stopped, finding an impossibility, which is to subtract a greater number from a lesser. But to proceed, How do you go to wor<sup>t</sup> with those Dividends which consist of more figures then one, and the Divisor having but one figure onely ?*

*Ans.* I set down the *Divisor* under the first figure of the *Dividend* towards the left hand, as is said before.

*Quest.*

Quest. 55. *What if that first figure be lesser then the Divisor?*

Ans. I have answered this question already, which is, that the *Divisor* must be placed a figure further, towards the right hand.

Quest. 56. *It is true, but you did not give an example; therefore give it now.*

Ans. If 17 were to be divided by 5, I cannot set 5 under the first figure 1; but I set it under the 7 thus  $\overline{)17}$  asking in 17, how many times 5, &c.

Quest. 57. *But if there were more figures in the Dividend, what then?*

Ans. Having finished the work of the first figure in the *Quotient*, I remove the *Divisor* under the next figure of the *Dividend* (on the right hand) and proceed as in the fourth Example of Division, Fol. 113.

Quest. 58. *The working of the first figure in the Quotient being finished, if you finde any Rest above the Divisor, what will you do with it?*

Ans. Every Unite so remaining (having some figure or cipher uncanceled on the right side thereof) must be accounted for so many tens as you may see in the second Note of Division, Fol. 113. And so I proceed according to the directions of the said fourth Example.

Quest. 59. *Suppose that the work of the first and second figure of the Quotient be finished, and coming to the work of the third or fourth figure, you cannot then have the Divisor once*

in the figure above it; what is to be done?

*Ans.* In such a case I set a cipher in the *Quotient*, and cancel the *Divisor*, to be removed a place further.

*Quest.* 60. But suppose after the removing of the *Divisor*, you finde it as before, that the figure above is still lesser then the *Divisor*?

*Ans.* If so, I should do as I did before, which is to set a cipher in the *Quotient*, &c. as you may plainly see in the third *Note of Division*, fol. 115.

*Quest.* 61. Do you not set sometimes two figures at once in the *Quotient*?

*Ans.* Never but one, and 9 is the highest figure that can be taken at once.

*Quest.* 62. How do you divide by two or more figures?

*Ans.* First, I place the *Divisor* in its right place, that is, I place it so, that it may be contained once, at least, in the upper figures in the *Dividend*.

*Quest.* 63. How do you form the question, in asking, how many times the *Divisor* is contained in those figures which are above it?

*Ans.* I do not take all the figures of the *Divisor* at once.

*Quest.* 64. How then?

*Ans.* I see how many times I can have the first figure of the *Divisor* in that figure or figures that are above it; and that figure which answers the question, I set in the *Quotient*.

*Quest.* 65. What do you wish those figures of the *Divisor* towards the right hand?

*Ans.*



*Answ.* I multiply them by the figure in the *Quotient*. For, though the *Divisor* should consist of never so many figures, I must set but one figure in the *Quotient* for every such *Divisor*.

*Quest. 66.* But when the *Divisor* consists of many figures, how will you hit the mark right in taking just such figure (to be set in the *Quotient*) that answers the question?

*Answ.* This is indeed the hardest thing in *Division*; for oftentimes the right answer cannot be found without making some trial or other, whether such figure (that we judge will answer the question) be either too great, too little, or just fit.

*Quest. 67.* You do not answer me: I ask when you set a figure in the *Quotient*, that you judge will answer the question. How do you know that you do not mistake, and that you have the right figure?

*Answ.* The answers of the Fifty one and fifty two questions, is a full answer to your question; yet because this is one of the chiefest questions of *Division*, I shall repeat it if you please.

*Quest. 68.* I am willing to hear it again, but make it short.

*Answ.* When the figure set in the *Quotient* (which I judge will answer the question) is too little; then (having multiplied and subtract, as before) I perceive it by this, that the Rest of the Subtraction is more then the *Divisor*: But when the said figure (set in the *Quotient*) is too great, I know it by this; That the *Products* (arising from the *Multiplication* of the *Divisor*) cannot be

subtracted from the figures (in the *Dividend*) which are above the said *Divisor*. You may see these two observations more at large in *Fol.* 120. 121. 122. and 123.

*Quest.* 69. *What is the next thing to be observed in Division.*

*Ans.* The next thing to be observed (having set the right figure in the *Quotient*) is to multiply and subtract exactly.

*Quest.* 70. *But if the Divisor consist of many figures, how many questions must you answer for every such great Divisor?*

*Ans.* Never but one answer, for every *Divisor*, great or small; and that is at the first figure towards the left hand.

*Quest.* 71. *Why so?*

*Ans.* Because every figure set in the *Quotient*, are the *Multipliers* of the several *Divisors* set under the *Dividend*.

*Quest.* 72. *Then you have so many figures in the Quotient, as you have Divisors under the Dividend.*

*Ans.* Yes, as you may perceive from the 26 to the 32 sum of *Division*.

*Quest.* 73. *This observation is worthy to be taken notice of; but concerning the subtracting of the several Products of the Multiplication of the figures of the Divisor, I remember you told me that you must set the Rest above every figure, from whence you subtract: Is it so?*

*Ans.* Yes.

*Quest.* 74. *But if you finde no rest in subtracting,*

ing, as taking 4 from 4, or 9 from 9, there remains nothing; what must you do?

*Answ.* When I set a cipher above such figure, when I finde no rest.

*Quest. 75. What, a ways.*

*Answ.* No; sometimes I must do it, and sometimes not.

*Quest. 76. What is your Rule in this case?*

*Answ.* When I finde a figure or figures uncanceled on the left hand (of that figure from which the Subtraction is made then I set a cipher above; but if I finde all the figures cancelled on the left hand, then I forbear the setting of a cipher; as you may see in the Seven and twentieth Sum of *Division*, and in the Sixth *Note*.

*Quest. 77. But what need is there of setting a cipher or ciphers, when there are some figures uncanceled on the left hand?*

*Answ.* Because every figure should keep its own place (and be esteemed according to its own value) for by omitting the setting of the cipher (or ciphers) the figures on the left hand, should be a place lower, then they ought to be, which would cause a great error in the work.

*Quest. 78. You say right, for that figure that ought to be in the place of Thousands, should be (in omitting a cipher) but in the place of Hundreds. But which way do you Subtract the several Products arising from the Quotient and Divisor, multiplied together?*

*Answ.* I follow the Rule of *Subtraction* before taught, *Fol. 54.*

## Of Division.

Quest. 79. *What is that?*

Ans. To take the lesser number from the greater; and if some *Products* be greater then the figure from whence I must Subtract, I borrow from the next upper figure, towards the left hand.

Quest. 80. *Is there no difference from that Substraction you use in Division, and the Substraction called Simple?*

Ans. The difference is not great, it is onely this. In *Simple Substraction* I borrow never but an Unite at once (which 1 is accounted for 10) but in Substracting in *Division*, then I borrow more, sometimes more, and sometimes less as need requires.

Quest. 81. *What if you did borrow too much or too little?*

Ans. It is easily discerned, how many Unites are (which is as many tens) needful to be borrowed.

Quest. 82. *How do you know that?*

Ans. Suppose that I were to Subtract 8, and that the figure above were but 2, then I say, 8 from 2, that cannot be. Now I see that I must borrow from the upper figure on the left hand, and also that 1 (which is 10) being borrowed, will serve my turn, then 10 and 2 is 12. Now I say, 8 from 12, there remains 4, which 4 I set above 2, cancelling the 2.

Quest. 83. *But if the Product (which arise from the Quotient and Divisor) that you are to Subtract, was 18: 28: or 38, &c. and the figure above but 2.*

Ans.

*Ans.* There is no difficulty in that: thus, If I were to Subtract 18, and finde but 2 above it, I should say, 18 from 2, that cannot be: Now I perceive, that in borrowing onely 1 (which is but 10) and the 2 is but 12, I should be still in want; therefore I borrow 2, which is 20, and the 2 is 22. Now I say, 18 from 22, there remains 4.

*Quest. 84.* I understand you; but, suppose you were to Subtract 28, and 2 being onely above, how many Unites would you borrow?

*Ans.* I should follow the Rule, which is to borrow as much as needs must: thus, If 28 is to be taken from the number above the *Divisor*: Now if 2 onely be found above, 28 cannot be subtracted from 2, therefore I borrow 3 unites from the left hand (because 2 would be too little) which 3 is 30, and 2 is 32. Now 28 being Subtractd from 32, there remains 4, &c. Further, suppose that 88 were to be subtracted, and 2 onely be found above the *Divisor*, then I should borrow no less then 9 Unites (from the other figure on the left hand) which 9 is 90, and 2 is 92. Now 88 from 92, there remains 4, &c.

*Quest. 85.* But if you finde a cipher, either above (or in that place from whence the said Product is to be subtracted) or else some ciphers on the left hand, from whence you use to borrow; what then?

*Ans.* I follow still the Rule before-mentioned, thus; if 28 were to be subtracted, and I finde a cipher in the *Dividend*, then I borrow 2,



which is 30; then I say 28 from 30, there remains 2, and so of the rest.

Quest. 86. *What do you with those Unites that you borrow?*

Ans. I subtract them from the next figure towards the left hand, and set the rest above it, as in the 28 and 29 Sum of Division.

Quest. 87. *What if you find ciphers in the Divisor, between Significant figures?*

Ans. The more ciphers there is in the Divisor, the easier the work is.

Quest. 88. *What do you with them?*

Ans. Nothing else but to cancel them; but I must observe (in so doing) not to cancel any figure above them, except ciphers which have no Significant figure on the left side of them.

Quest. 89. *What do you with those Significant figures in the Divisor?*

Ans. I Multiply and Subtract, as in the 31 and 32 Sum of Division.

Quest. 90. *How do you place your Divisor, when you remove it, when it consist of more figures than one?*

Ans. In removing the Divisor (great or small) the general rule is to place every time, the said Divisor, a place further towards the right hand, as is plainly shewn in the tenth Note; between the Forty three and Forty four Sum of Division.

Quest. 91. *How often must you remove the Divisor?*

Ans. I must remove it so often, until the  
Unites

Unites of the *Divisor*, come to be right under the Unites of the *Dividend*.

Quest. 92. *How do you go to work, when the Divisor ends with ciphers?*

Ans. I may follow the general way; but for shortness sake, I set the ciphers of the *Divisor* under the *Dividend*, towards the right hand, and divide the remaining part of the *Dividend* (on the left hand) by the remaining part of the *Divisor*, as is taught before; as in the 52 Sum of Division.

Quest. 93. *But if the Divisor consist of an unite onely, in the first place, towards the left hand, and nothing but ciphers towards the right, what course do you take for the best?*

Ans. If it happen so, such Divisions are soon done; for there is nothing else to do, but to cut off so many places of the *Dividend* (beginning from the right hand towards the left) as the *Divisor* hath ciphers.

Quest. 94. *What then?*

Ans. The figures so cut off towards the right hand, is the Rest of the *Division*, and those figures of the *Dividend* which are on the left hand, is the whole number (or integral part) of the *Quotient*; as you may see in the 50 Sum of Division.

Quest. 95. *I remember you told me before, that you had another way of Division?*

Ans. Yes, I told you so.

Quest. 96. *What way is that?*

Ans. It is a way which requires less figures in

in the work, then the former.

Quest. 97. *Shew the difference in few words.*

Ans. Having placed the *Divisor* under the *Dividend* (as before is taught) you must not begin at the first figure of your *Divisor* towards the left hand (when you multiply) but at the first figure toward the right, and multiply that figure by the figure in the *Quotient* (that answer the question) and so going towards the left hand.

Quest. 98. *Is no difference in the placing of the Divisor under the Dividend, and in the removing of it?*

Ans. None at all.

Quest. 99. *But at what figure do you begin, when you make the question, to finde the figures of the Quotient; do you begin at the left hand of the Divisor, or at the right?*

Ans. This second way of *Division*, and the first agree also in that, that every question (that is made to finde the figure in the *Quotient*) is always made upon the first figure of the *Divisor*, towards the left hand.

Quest. 100. *Is there no more difference, then what you have said?*

Ans. Yes: The difference lies further in the subtracting of the *Products* arising from the *Multiplication* of the figures of the *Quotient*, and *Divisor* multiplied together.

Quest. 101. *Where lies the difference between the Subtraction in this way of Division, and the former.*

Ans. In the first way of *Division*, in Sub-  
tracting

abstracting the *Products* of the *Divisor*, if any unites be borrowed, they are to be subtracted alone, presently from the next figure, from whence it was borrowed, and the rest is to be set above. All this is to be done before you proceed to multiply the second figure of the *Divisor*; but in this second way, you must do otherwise.

Quest. 102. *Which way must I then go?*

Ans. When you have borrowed any figure (or number) from the left hand, and after the subtraction is made (and the Rest set down) you must not presently subtract those Unites so borrowed from the next figure of the *Dividend* (as you did before) but you must keep or bear in minde those Unites so borrowed.

Quest. 103. *What do you with those Unites that you bear in minde?*

Ans. I adde them to the *Product* of the *Multiplication* of the next figure of the *Divisor*, to be subtracted from the figure above.

Quest. 104. *I perceive that in subtracting the several Products of the Divisor, you go from the right hand towards the left?*

Ans. Yes; and that is quite contrary to the other way of *Division*.

Quest. 105. *Suppose you were to borrow at every Subtraction you are to make, by reason of the greatness of the several Products that are to be subtracted.*

Ans. I must borrow as before to supply that want, and be careful to keep every Unite borrowed in minde, to be added to the next *Product* of the

the *Multiplication* of the next figure, and so on until I come to the last figure of the *Divisor*; as in the first Example of the second way of *Division*, fol. 145.

*Quest.* 106. But if you finde that those figures (or places) from whence you are to borrow, be either too little, or onely ciphers: where do you borrow then?

*Answ.* It is needless to trouble my self to observe, whether those figures, from whence I must borrow, be Significant figures, or not.

*Quest.* 107. Why so?

*Answ.* Because I pay the debt in adding what I have borrowed to the *Product* of the *Multiplication* of the next figure of the *Divisor*.

*Quest.* 108. I shall ask you a question more, and then conclude.

*Answ.* Ask what you please.

*Quest.* 109. Suppose that when you come to borrow (as before) you finde all the figures above towards the left hand (except the last) to be onely ciphers: where do you borrow then?

*Answ.* It is true, that I cannot borrow any thing from a cipher or ciphers; therefore I borrow what is needful, from the next Significant figure that I finde on the left hand; as you may clearly see in the working of the 49 Sum of *Division*, fol. 140.



## Reduction by Multiplication.

**R**eduction by Multiplication (called by some *Reduction Descending*) teacheth to reduce Moneys, Weights, and Measures, from greater Denominations into smaller ; as Pounds Sterling, to Shillings, Pence, &c. Or Pounds Weight, to Ounces, Drams, &c.

When any Number is propounded (either Money, Weight, or Measure) to be reduced into a lesser denomination or name. Consider how many peeces of the less, make one of the greater, and multiply one number by the other ; the *Product* is the number required to be short : I refer the *Learner* to the following Table, which will shew him sufficiently, how to work the following Questions.

### Of English Money.

|           |                                  |          |                                     |                    |                   |
|-----------|----------------------------------|----------|-------------------------------------|--------------------|-------------------|
| To Reduce | { Pounds<br>Shillings<br>Pence } | } into { | { Shillings<br>Pence<br>Farthings } | } Multiply<br>by { | { 20<br>12<br>4 } |
|           |                                  |          |                                     |                    |                   |
|           |                                  |          |                                     |                    |                   |

*Further.*

|  |  |                 |                                |
|--|--|-----------------|--------------------------------|
| To Reduce<br>Pounds at<br>one ope-<br>ration in-<br>to | { Groats<br>Pence<br>Farthings<br>Nobles<br>Crowns } | } Multiply by { | { 60<br>240<br>960<br>3<br>4 } |
|  |  |                 |                                |
|  |  |                 |                                |
|  |  |                 |                                |
|  |  |                 |                                |

*Averdupois*

*Reduction by Multiplication.**Averdupois Great Weight.*

|           |          |      |          |             |    |
|-----------|----------|------|----------|-------------|----|
| To Reduce | Hundreds | into | Quarters | Multiply by | 4  |
|           | Quarters |      | Pounds   |             | 28 |
|           | Pounds   |      | Ounces   |             | 16 |

*Averdupois Subtile.*

|           |          |      |          |             |    |
|-----------|----------|------|----------|-------------|----|
| To Reduce | Pounds   | into | Ounces   | Multiply by | 16 |
|           | Ounces   |      | Drams    |             | 8  |
|           | Drams    |      | Scruples |             | 3  |
|           | Scruples |      | Grains   |             | 20 |

*Averdupois Little Weight.*

|           |        |      |        |             |    |
|-----------|--------|------|--------|-------------|----|
| To Reduce | Pounds | into | Ounces | Multiply by | 16 |
|           | Ounces |      | Drams  |             | 16 |

*Troy Weight.*

|           |             |      |             |             |    |
|-----------|-------------|------|-------------|-------------|----|
| To reduce | Pounds      | into | Ounces      | Multiply by | 12 |
|           | Ounces      |      | Peny Weight |             | 20 |
|           | Peny Weight |      | Grains      |             | 24 |

*Dry Measures.*

|           |          |      |          |             |    |
|-----------|----------|------|----------|-------------|----|
| To Reduce | Weys     | into | Quarters | Multiply by | 5  |
|           | Quarters |      | or Seams |             | 8  |
|           | Bushels  |      | Bushels  |             | 4  |
|           | Pecks    |      | Pecks    |             | 16 |
|           |          |      | Pints    |             |    |

*Long Measures.*

|           |          |      |                   |             |    |
|-----------|----------|------|-------------------|-------------|----|
| To Reduce | Miles    | into | Furlongs          | Multiply by | 8  |
|           | Furlongs |      | Perches           |             | 40 |
|           | Perches  |      | Half-Yard         |             | 11 |
|           | Yards    |      | Foot              |             | 3  |
|           | Yards    |      | Quarters          |             | 4  |
|           | Quarters |      | Nails             |             | 4  |
|           | Ells     |      | Quarter of Yard   |             | 5  |
|           | Foot     |      | Inches            |             | 12 |
|           | Fadoms   |      | Foot              |             | 6  |
|           | Inches   |      | Quarter of a Inch |             | 4  |
|           | Inches   |      | Barley Corn       |             | 3  |

*Further.*

|           |         |      |         |             |     |
|-----------|---------|------|---------|-------------|-----|
| To Reduce | Acres   | into | Roods   | Multiply by | 4   |
|           | Roods   |      | Perches |             | 40  |
|           | Perches |      | Inches  |             | 198 |

*Liquid Measures.*

|           |          |      |                |             |    |
|-----------|----------|------|----------------|-------------|----|
| To Reduce | Tuns     | into | Butts or Pipes | Multiply by | 2  |
|           | Butts    |      | Hogheads       |             | 2  |
|           | Hogheads |      | Gallons        |             | 63 |
|           | Gallons  |      | Pottles        |             | 2  |
|           | Pottles  |      | Quarts         |             | 2  |
|           | Quarts   |      | Fints          |             | 2  |

Of

## Of Time.

To Reduce  $\left\{ \begin{array}{l} \text{Years} \\ \text{Weeks} \\ \text{Days} \\ \text{Hours} \end{array} \right\}$  into  $\left\{ \begin{array}{l} \text{Days} \\ \text{Days} \\ \text{Hours} \\ \text{Minutes} \end{array} \right\}$   $\left\{ \begin{array}{l} \text{Multiply} \\ \text{by} \end{array} \right\} \left\{ \begin{array}{l} 365 \\ 7 \\ 24 \\ 60 \end{array} \right\}$

## Of things accounted by the Gross or Dozen.

To Reduce  $\left\{ \begin{array}{l} \text{Gross} \\ \text{Dozen} \end{array} \right\}$  into  $\left\{ \begin{array}{l} \text{Dozen} \\ \text{Particular} \\ \text{things} \end{array} \right\}$   $\left\{ \begin{array}{l} \text{Multiply} \\ \text{by} \end{array} \right\} \left\{ \begin{array}{l} 12 \\ 12 \end{array} \right\}$

## I Question.

**I**N 312 Pounds, how many Shillings? *facit*  
6240 β.

$\begin{array}{ccc} \mathcal{L} & \beta & \mathcal{L} \\ 1 & - 20 & - 312 \\ & & 20 \end{array}$

Facit—6240 β.

2. Item, In 1087  $\mathcal{L}$ , how many β? *facit*  
21740 β.

3. Item, In 392  $\mathcal{L}$  12 β, how many β?  
*facit* 7852 β.

In multiplying the 392  $\mathcal{L}$  by 20, take in the 12 β, the 2 β first, then the 1.

4. Item,

# Reduction by Multiplication.

177

4. *Item*, In 1048 £ 7 β, how many β? *facit* 20967 β.

5. *Item*, In 37 β, how many q? *facit* 444 q.

6. *Item*, In 448 q, how many Farthings? *facit* 1792 q.

7. *Item*, In 362 β 6 q, how many q? *facit* 4350 q.

In Multiplying by 12, take in the 6 q.

8. *Item*, In 807 β 11 q, how many q? *facit* 9695 q.

9. *Item*, In 69 q 2 q, how many q? *facit* 278 q.

10. *Item*, In 341 £, how many q? *facit* 81840 q.

Multiply by 20, and the *Product* by 12, or else by 240.

11. *Item*, In 86 £ 19 β, how many q? *facit* 20868 q.

12. *Item*, In 804 £ 0 β 6 q, how many q? *facit* 192966 q.

13. *Item*, In 841 β, how many q? *facit* 40368 q.

Multiply first by 12, then by 4, or else by 48.

14. *Item*, In 316 β 8 q, how many q? *facit* 15200 q.

15. *Item*, In 868 £ 13 β 8 q, how many q? *facit* 208484 q.

16. *Item*, In 346 £ 19 β 6 q 2 q, how many Farthings? *facit* 333098 q.

Multiply the £ by 20, and take in the 19 β, then by 12 taking in the 6 q, and lastly by 4, and take in the 2 q.

N

17. *Item*,



*Reduction by Multiplication.*

17. *Item*, In 581 £ 0 β 0 q, how many q? *facit* 557763 q.

18. *Item*, In 807 £, how many Crowns? *facit* 3228 Δ.

19. *Item*, In 98 £, how many Half crowns? *facit* 784 Hal crowns.

20. *Item*, In 124 β, how many Groats? *facit* 372 Groats.

21. *Item*, In 36 £ 16 β, how many Groats? *facit* 2208 Groats.

22. *Item*, In 68 Half crowns, how many q? *facit* 2040 q.

23. *Item*, In 341 Δ 2 β 8 q, how many q? *facit* 20492 q.

24. *Item*, 98 Nobles, how many q? *facit* 7840 q.

A Noble is 6 β 8 q or 80 q, therefore multiply by 80.

25. *Item*, In 687 Marks, how many q? *facit* 109920 q.

26. *Item*, In 143 Marks, 6 β 9 q, how many q? *facit* 22961 q.

| Mark | β   | q | Marks        | β     | q  |
|------|-----|---|--------------|-------|----|
| 1    | 13  | 4 | 143          | 6     | 9  |
|      | 12  |   | 160          | 12    |    |
|      | 30  |   | 8580         | 81    | q. |
|      | 13  |   | 143          |       |    |
|      |     |   | Add          | 81    |    |
|      | 160 | q |              |       |    |
|      |     |   | <i>Facit</i> | 22961 | q  |

27. *Item*,

*Reduction by Multiplication.*

179

27. *Item*, In 804 Marks 12  $\beta$  11  $\text{q}$ , how many Farthings? *facit* 515180  $\text{q}$ .

28. *Item*, How many Farthings will amount to 109 times, 2  $\mathcal{L}$  16  $\beta$  6  $\text{q}$  3  $\text{q}$ ? *facit* 295935 Farthings.

Reduce first 2  $\mathcal{L}$  16  $\beta$  6  $\text{q}$  3  $\text{q}$  into Farthings, then multiply by 109.

*Averdupois Great Weight and Subtile.*

29. In 34 Hundred, how many Quarters? *facit* 136 Quarters.

30. *Item*, In 84 C 3 qrs, how many qrs? *facit* 339 qrs.

31. *Item*, In 34  $\text{lb}$ , how many ounces? *facit* 544 ounces.

32. *Item*, In 986  $\text{lb}$  6 ounces, how many ounces? *facit* 15782 ounces.

33. *Item*, In 312 C 3 qrs 19  $\text{lb}$ , how many  $\text{lb}$ ? *facit* 35047  $\text{lb}$ .

34. *Item*, In 891 C 0 qr 27  $\text{lb}$  8 ounces, how many ounces? *facit* 1597112 ounces?

35. *Item*, In 431  $\text{lb}$  15 ounces, how many drams? *facit* 55288 drams.

36. *Item*, In 310  $\text{lb}$  9 ounce. 0 dra. 2 scruples, how many scruples? *facit* 311258 scruples.

37. *Item*, In 868 drams, how many grains? *facit* 52080 grains.

38. *Item*, In 86  $\text{lb}$  0 ounce. 6 dra. 0 scr. and 16 grains, how many grains? *facit* 660856 grains.

N

39. *Item*,

*Reduction by Multiplication.*

39. *Item*, In 97 C 3 qrs 27 lb 15 ounce.  
7 dra. 2 scr. 19 grains, how many grains? *facit* 84295679 grains.

*Averdupois Little Weight.*

40. In 380 lb, how many ounces? *facit* 6080 ounces.

41. *Item*, In 138 ounces, how many drams? *facit* 2208 drams.

42. *Item*, In 986 lb 15 ounce. 15 drams, how many drams? *facit* 52671 drams.

*Troy Weight.*

43. In 84 lb, how many ounces? *facit* 1008 ounces.

44. *Item*, 68 lb 9 ounce. how many ounces? *facit* 825 ounces.

45. *Item*, In 126 lb 10 ounce. 8 penny weight, how many penny weight? *facit* 30448 penny weight.

46. *Item*, In 98 lb 0 ounce. 6 pw. how many grains? *facit* 564624 grains.

47. *Item*, In 182 lb 9 ounce. 19 pw. 23 grains, how many grains? *facit* 1053119 grains.

*Dry Measures.*

48. In 92 Seams (or Quarters) of Corn, how many Bushels? *facit* 736 Bushels.

49. *Item*, In 620 Seams 6 Bushels? how many Pecks? *facit* 19864 Pecks.

50. *Item*,

*Reduction by Multiplication.*

181

50. *Item*, In 367 Pecks, how many Pints?  
*facit* 5872 Pints.

51. *Item*, In 89 Bushels 2 Pecks 13 Pints,  
how many Pints? *facit* 5741 Pints.

52. *Item*, In 187 Seams 3 Bushels 1 Peck  
12 Pints, how many Pints? *facit* 95964 Pints.

*Liquid Measures.*

53. In 38 Tuns, how many Butts (or Pipes)  
and Hogsheads? *facit* 76 Butts, and 152 Hog-  
heads.

54. *Item*, In 124 Tuns, how many Hog-  
heads? *facit* 496 Hogsheads.

55. *Item*, In 58 Hogsheads, how many Gal-  
lons? *facit* 3654 Gallons.

56. *Item*, In 94 Pottles, how many Quarts  
and Pints? *facit* 188 Quarts, and 376 Pints.

57. *Item*, In 87 Hogsheads, how many  
Quarts? *facit* 21924 Quarts.

58. *Item*, In 128 Tuns 1 Hogshead 40 Gal-  
lons 1 Pottle 1 Quart 1 Pint, how many Pints?  
*facit* 258879 Pints.

*Long Measures.*

59. In 32 Miles, how many Furlongs? *facit*  
256 Furlongs.

60. *Item*, In 64 Furlongs, how many Perches?  
*facit* 2560 Perches.

61. *Item*, In 64 Miles, how many Perches?  
*facit* 20480 Perches.

N 3

62. *Item*,

*Reduction by Multiplication.*

62. *Item*, In 103 Perches, how many Half-yards? *facit* 1122 Half-yards.

63. In 46 Perches, how many Inches? *facit* 9108 Inches.

64. *Item*, In 420 Acres, how many Roods? *facit* 1680 Roods.

65. *Item*, In 356 Acres 2 Roods 20 Perches, how many Perches? *facit* 57060 Perches.

66. *Item*, In 88 Foot, how many Inches? *facit* 1056 Inches.

67. *Item*, In 108 Yards, how many Barley Corns? *facit* 11664 Barley Corns in length.

68. *Item*, In 42 Miles, how many Inches? *facit* 2661120 Inches.

69. *Item*, In 48600 Miles, how many Barley Corns? *facit* 9237888000 Barley Corns.

*Of Time.*

70. In 64 Years, how many days? *facit* 23360 days.

71. *Item*, In 369 Years 8 Moneths 20 Days, how many days, if 12 Moneths be reckoned for every Year, and 30 Days for every Moneth? *facit* 133100 days.

72. *Item*, In 110 Years 9 Moneths 3 Weeks 3 Days, how many Days, counting 13 Moneths for every Year, and 4 Weeks for every Moneth? *facit* 43956 Days.

73. *Item*, In 1662 Years, how many Days and Hours? *facit* 606630 Days, and 14559120 Hours.

74. *Item*,



74. *Item*, In 1658 Years 164 Days 23 Hours 59 Minutes ; how many Days, Hours, and Minutes? *facit* 605334 Days 14528039 Hours, and 871682399 Minutes.

75. *Item*, A. hath 24 Farms, in every Farm 6 Stables, in every Stable 32 Sheep, each Sheep hath 4 Lambs ; the question is, how many Feet there was in all? *facit* 92160 Feet.

76. *Item*, A rich Man hath 10 Villages belonging to him ; every Village hath 5 Streets, in every Street 30 Houses, in every House 6 Chambers, in every Chamber 12 Desks, in every Desk 24 Drawers, in every Drawer 6 Purfes, in every Purfe 20 Peeces of Gold, and each Peece is worth 21  $\beta$  ; the question is, what amounts the whole sum in Farthings? *facit* 313528320000 Farthings.

## *Reduction by Division.*

**R** *eduction by Division* (called by some *Reduction Ascending*) teacheth to reduce a Number of a lesser Denomination (either Money, Weight, or Measure, &c.) into a greater ; as Farthings to Pence, Pence to Shillings, Shillings to Pounds, &c. Or Drams to Ounces, Ounces to Pounds, &c. The following Table will be a sufficient direction to make the operations of this *Reduction*.

N 4

Of

*Reduction by Division.**Of English Money.*

To Reduce { Farthings } into { Pence } Divide { 4  
 { Pence } { Shillings } { 12  
 { Shillings } { Pounds } by { 20

*Farther.*

To Reduce { Groats } into Pounds 60  
 { Pence } at one operation, Divide by { 240  
 { Farthings } { 960  
 { Nobles } { 3  
 { Crowns } { 4

*Averdupois Great Weight and Subtile.*

To Reduce { Grains } into { Scruples } Divide by { 20  
 { Scruples } { Drams } { 3  
 { Drams } { Ounces } { 8  
 { Ounces } { Pounds } { 16  
 { Pounds } { Quarters } { 28  
 { Quarters } { Hundred } { 4

*Averdupois Little Weight.*

To Reduce { Drams } into { Ounces } Divide { 16  
 { Ounces } { Pounds } by { 16

*Troy Weight.*

|           |             |   |             |   |           |    |
|-----------|-------------|---|-------------|---|-----------|----|
| To reduce | Grains      | } | Peny Weight | } | Divide by | 24 |
|           | Peny Weight |   | Ounces      |   |           | 20 |
|           | Ounces      |   | Pounds      |   |           | 12 |

*Dry Measures.*

|           |           |   |      |          |   |           |    |
|-----------|-----------|---|------|----------|---|-----------|----|
| To Reduce | Pints     | } | into | Pecks    | } | Divide by | 16 |
|           | Pecks     |   |      | Bushels  |   |           | 4  |
|           | Bushels : |   |      | Quarters |   |           | 8  |
|           | Quarters  |   |      | Ways     |   |           | 5  |

*Long Measures.*

|           |                   |   |      |          |   |           |     |
|-----------|-------------------|---|------|----------|---|-----------|-----|
| To Reduce | Barley Corns      | } | into | Inches   | } | Divide by | 3   |
|           | Quar. of a Inches |   |      | Inches   |   |           | 4   |
|           | Feet              |   |      | Fadoms   |   |           | 6   |
|           | Inches            |   |      | Feet     |   |           | 12  |
|           | Quart. of Yards   |   |      | Ells     |   |           | 5   |
|           | Nails             |   |      | Quarters |   |           | 4   |
|           | Quart. of Yards   |   |      | Yards    |   |           | 4   |
|           | Feet              |   |      | Yards    |   |           | 3   |
|           | Half-Yards        |   |      | Perches  |   |           | 11  |
|           | Perches           |   |      | Furlongs |   |           | 40  |
|           | Furlongs          |   |      | Miles    |   |           | 8   |
|           | Inches            |   |      | Perches  |   |           | 198 |
|           | Perches           |   |      | Roods    |   |           | 40  |
|           | Roods             |   |      | Acres    |   |           | 4   |

*Liquid*

*Liquid Measures.*

|           |          |        |          |             |    |
|-----------|----------|--------|----------|-------------|----|
| To Reduce | Pints    | } into | Quarts   | } Divide by | 2  |
|           | Quarts   |        | Pottles  |             | 2  |
|           | Pottles  |        | Gallons  |             | 2  |
|           | Gallons  |        | Hogheads |             | 63 |
|           | Hogheads |        | Butts    |             | 2  |
|           | Butts    |        | Tuns     |             | 2  |

*Of Time.*

|           |         |        |                    |             |     |
|-----------|---------|--------|--------------------|-------------|-----|
| To Reduce | Minutes | } into | Hours <sup>s</sup> | } Divide by | 60  |
|           | Hours   |        | Days               |             | 24  |
|           | Days    |        | Weeks              |             | 7   |
|           | Days    |        | Years              |             | 365 |

*Of things accounted by the Gross or Dozen.*

|           |             |        |       |             |    |
|-----------|-------------|--------|-------|-------------|----|
| To Reduce | Particulars | } into | Dozen | } Divide by | 12 |
|           | Dozen       |        | Gross |             | 12 |

*1 Question.*

I Question.

IN 6240 Shillings, how many Pounds? *facit*  
312  $\mathcal{L}$ .

$$\begin{array}{r} \beta \qquad \mathcal{L} \qquad \beta \\ 20 \text{ --- } 1 \text{ --- } 6240 \end{array}$$

6240 (312 Pounds.  
2220 *Facit.*

2. Item, In 21740  $\beta$ , how many  $\mathcal{L}$ ? *facit*  
1087  $\mathcal{L}$ .

3. Item, In 2060  $\beta$ , how many  $\Delta$ ? *facit*  
412 CROWNS.

4. Item, In 7852  $\beta$ , how many  $\mathcal{L}$ ? *facit*  
392  $\mathcal{L}$  12  $\beta$ .

5. Item, In 4650  $\mathcal{G}$ , how many  $\beta$ ? *facit*  
387  $\beta$  6  $\mathcal{G}$ .

6. Item, In 8901 Groats, how many  $\beta$ ? *facit*  
2967  $\beta$ .

7. Item, In 17290  $\beta$ , how many  $\mathcal{L}$ ? *facit*  
864  $\mathcal{L}$  10  $\beta$ .

8. Item, In 1792  $\mathcal{G}$ , how many  $\mathcal{G}$ ? *facit*  
448  $\mathcal{G}$ .

9. Item, In 32680  $\mathcal{G}$ , how many Groats?  
*facit* 8170 Groats.

10. Item, In 81840  $\mathcal{G}$ , how many  $\mathcal{L}$ ? *facit*  
341  $\mathcal{L}$ .

Divide by 12, and then by 20, or else by  
240.

11. Item,



*Reduction by Division.*

11. *Item*, In 20868  $\text{q}$ , how many  $\text{L}$ ? *facit* 86  $\text{L}$  19  $\beta$ .

12. *Item*, In 21887  $\text{q}$ , how many Six pences? *facit* 3647 Six pences, and 5  $\text{q}$  over.

13. *Item*, In 40368  $\text{q}$ , how many  $\beta$ ? *facit* 841  $\beta$ .

14. *Item*, In 208484  $\text{q}$ , how many  $\text{L}$ ? *facit* 868  $\text{L}$  13  $\beta$  8  $\text{q}$ .

15. *Item*, In 333098  $\text{q}$ , how many  $\text{L}$ ? *facit* 346  $\text{L}$  19  $\beta$  6  $\text{q}$  2  $\text{q}$ .

16. *Item*, In 3228  $\Delta$ , how many  $\text{L}$ ? *facit* 807  $\text{L}$ .

17. *Item*, In 784 Half crowns, how many  $\text{L}$ ? *facit* 98  $\text{L}$ .

18. *Item*, In 2203 Groats, how many  $\text{L}$ ? *facit* 35  $\text{L}$  16  $\beta$ .

19. *Item*, In 2040  $\text{q}$ , how many Half crowns? *facit* 68 Half crowns.

20. *Item*, In 20492  $\text{q}$ , how many  $\Delta$ ? *facit* 341  $\Delta$  2  $\beta$  8  $\text{q}$ .

21. *Item*, In 7840  $\text{q}$ , how many Nobles? *facit* 98 Nobles.

22. *Item*, In 22961  $\text{q}$ , how many Marks? *facit* 143 Marks 6  $\beta$  9  $\text{q}$ .

23. *Item*, In 2472960 Farthings, how many Marks? *facit* 3864 Marks.

24. *Item*, In 295935  $\text{q}$ , how many pieces at 2  $\text{L}$  16  $\beta$  6  $\text{q}$  3  $\text{q}$  the piece? *facit* 109 pieces.

Reduce 2  $\text{L}$  16  $\beta$  6  $\text{q}$  3  $\text{q}$  into Farthings, and the *Product* is the *Divisor*.

*Aver-*

*Averdupois Great Weight and Subtile.*

25. In 544 Ounces, how many lb ? *facit* 34 lb.
26. *Item*, In 12854 Ounces, how many lb ? *facit* 803 lb 6 ounces.
27. *Item*, In 346 Quarters of C, how many C ? *facit* 86 C 2 quarters.
28. *Item*, In 68400 Ounces, how many Quarters ? *facit* 152 Quarters 19 lb.
29. *Item*, In 55288 Drams, how many lb ? *facit* 431 lb 15 ounces.
30. *Item*, In 48963 Scruples, how many Drams ? *facit* 16321 Drams.
31. *Item*, In 68080 Grains, how many Scruples ? *facit* 3404 Scruples.
32. *Item*, In 960487 Scruples, how many lb ? *facit* 2501 lb 4 ounce. 2 drams 1 scruple.
33. *Item*, In 684360 Drams, how many Hundreds ? *facit* 47 C 3 Quarters 2 lb 7 ounce. 4 drams.
34. *Item*, In 308476830 Grains, how many Hundred ? *facit* 358 C 2 qrs 14 lb 4 ounce. 2 dra. 1 scrup. 10 grains.

*Averdupois Little Weight.*

35. In 6080 Ounces, how many lb ? *facit* 380 lb.
36. *Item*, In 2208 Drams, how many Ounces ? *facit* 138 Ounces.
37. *Item*,

*Reduction by Division.*

37. *Item*, In 252671 Drams, how many lb?  
*facit* 986 lb 15 ounces 15 drams.

*Troy Weight.*

38. In 816 Ounces, how many lb? *facit*  
 68 lb.

39. *Item*, In 600 Penny weight, how many  
 Ounces? *facit* 30 Ounces.

40. *Item*, In 860060 Penny weight, how  
 many lb? 3583 lb 7 ounces.

41. *Item*, In 48360 Grains, how many Oun-  
 ces? *facit* 100 Ounces 15 pw.

42. *Item*, In 64780 Grains, how many lb?  
*facit* 11 lb 2 ounces 19 pw 4 grains.

*Dry Measures.*

43. In 736 Bushels of Corn, how many Seams  
 (or Quarters?) *facit* 92 Seams.

44. *Item*, In 8064 Pecks, how many Bushels?  
*facit* 2016 Bushels.

45. *Item*, In 63400 Pints, how many Pecks?  
*facit* 4275 Pecks.

46. *Item*, In 1064809 Pints, how many  
 Seams? *facit* 2079 Seams 5 Bushels 2 Pecks  
 9 Pints.

*Liquid Measures.*

47. In 648 Butts (or Pipes) how many Tuns?  
*facit* 324 Tuns.

48. *Item*

### *Reduction by Division.*

191

48. *Item*, In 9640 Hogsheads, how many Butts? *facit* 4820 Butts.

49. *Item*, In 18600 Gallons, how many Hogsheads? *facit* 295 Hogsheads 15 Gallons.

50. *Item*, In 648600 Quarts, how many Gallons? *facit* 162150 Gallons.

51. *Item*, In 846006 Pints, how many Hogsheads? *facit* 1678 Hogsheads 36 Gallons 1 Pottle 1 Quart.

52. *Item*, In 1040093 Pints? how many Tuns? *facit* 515 Tuns 1 Butt 1 Hogshead 42 Gallons 1 Pottle 0 Quart 1 Pint.

### *Long Measures.*

53. In 4860 Furlongs, how many Miles? *facit* 607 Miles and 4 Furlongs.

54. *Item*, In 40868 Perches, how many Furlongs? *facit* 1021 Furlongs 28 Perches.

55. *Item*, In 40808 Perches, how many Miles? *facit* 127 Miles 5 Furlongs 28 Perches.

56. *Item*, In 9900 Inches, how many Perches? *facit* 50 Perches.

57. *Item*, In 1368 Foot, how many Yards? *facit* 456 Yards.

58. *Item*, In 59994 Barley Corns, how many Perches? *facit* 101 Perches.

59. *Item*, In 1338 Nails, how many Yards? *facit* 83 Yards 2 Quarters 2 Nails.

60. *Item*, In 603 Quarters of Yards, how many Ells? *facit* 120 Ells 3 Quarters of a Yard.

61. *Item*, In 6840008604 Barley Corns in length

*Reduction by Division.*

length, how many Miles? *facit* 35984 Miles  
7 Furlongs 6 Perches.

62. *Item*, In 4200 Perches, how many Roods?  
*facit* 105 Roods.

63. *Item*, In 19360 Perches, how many Acres?  
*facit* 121 Acres.

64. *Item*, In 10672 Perches, how many Acres?  
*facit* 66 Acres 2 Roods 32 Perches.

*Of Time.*

65. In 43800 days, how many Years? *facit*  
120 Years.

66. *Item*, In 18648 Hours, how many Days?  
*facit* 777 Days.

67. *Item*, In 30069 Minutes, how many  
Hours? *facit* 501 Hours 9 Minutes.

68. *Item*, In 4087680 Minutes, how many  
Moneths at 30 Days every Moneth? *facit* 94  
Moneths 18 days 16 hours.

69. *Item*, In 403200 Minutes, how many  
Weeks? *facit* 40 Weeks.

70. *Item*, In 872496000 Minutes, how  
many Years? *facit* 1660 Years.

*Reduction*



# Reduction by Multiplication and Division.

**T**His *Reduction* contains the two former, and teacheth, how to reduce one kinde of money into another, and shews likewise, to know the worth of a quantity of Yards (Ells, lb, Ounces, &c.) at a certain price the Yard, as the following examples will plainly shew.

## 1 Question.

In 304 Half crowns how many Groats? *facit*  
2280 Groats.

| Half crown | ℥     | Half crowns |
|------------|-------|-------------|
| 1          | 30    | 304         |
| ℥          | Groat | 30          |
| 4          | 1     | 9120 ℥      |

12  
9120 (2280 Groats  
4444 *Facit.*

## Another form.

| ℥    | Groat         | Half crowns |
|------|---------------|-------------|
| 4    | 1             | 304         |
|      |               | 30          |
| 12   |               |             |
| 9120 | (2280 Groats  | 9120        |
| 4444 | <i>Facit.</i> |             |

Q

2. Item,

*Reduction by Multiplication and Division.*

2. *Item*, In 2280 Groats, how many Half crowns? *facit* 304 Half crowns.

3. *Item*, in 189  $\beta$ , how many Nine pences? *facit* 252 nine pences.

4. *Item*, In 252 Nine pences, how many Shillings? *facit* 189  $\beta$ .

5. *Item*, in 845 Groats, how many three pences? *facit* 1126 three pences, and 2  $\text{q}$  over.

6. *Item*, in 1126 three pences and 2  $\text{q}$ , how many Groats? *facit* 845 Groats.

7. *Item*, in 270 pieces of money at 4  $\text{q}$  2  $\text{q}$ , how many  $\text{L}$ ? *facit*  $\text{L}$  1  $\beta$  3  $\text{q}$ .

8. *Item*, in 840 pieces at 15  $\beta$  the piece, how many  $\text{L}$ ? *facit* 630  $\text{L}$ .

9. *Item*, in 630  $\text{L}$ , how many pieces at 15  $\beta$  the piece? *facit* 840 pieces.

10. *Item*, in 346 Angels, how many pieces at 4  $\beta$  the piece? *facit* 865 pieces.

11. *Item*, in 865 pieces at 4  $\beta$  the piece, how many Angels? *facit* 346 Angels.

12. *Item*, in 406  $\text{L}$  12  $\beta$  8  $\text{q}$ , how many Half crowns? *facit* 3253 Half crowns and 2  $\text{q}$  over.

13. *Item*, in 3253 Half crowns and 2  $\text{q}$ , how many  $\text{L}$ ? *facit* 406  $\text{L}$  12  $\beta$  8  $\text{q}$ .

14. *Item*, in 860 Nobles, how many Groats? *facit* 17200 Groats.

15. *Item*, in 17200 Groats, how many Nobles? *facit* 860 Nobles.

16. *Item*, in 420 Marks, how many  $\text{L}$ ? *facit* 280  $\text{L}$ .

17. *Item*,

*Reduction by Multiplication and Division.* 195

17. *Item*, in 280 £, how many Marks? *facit* 420 Marks.

18. *Item*, in 123 pieces at 13  $\text{g}$  2  $\text{q}$  the piece, how many £? *facit* 6 £ 18  $\beta$  4  $\text{g}$  2  $\text{q}$ .

19. *Item*, in 6 £ 18  $\beta$  4  $\text{g}$  2  $\text{q}$ , how many pieces at 13  $\text{g}$  2  $\text{q}$ ? *facit* 123 pieces.

20. *Item*, in 847 pieces at 6  $\text{g}$  2  $\text{q}$ , how many £? *facit* 22 £ 18  $\beta$  9  $\text{g}$  2  $\text{q}$ .

21. *Item*, in 164 Marks, how many pieces at 4  $\text{g}$  2  $\text{q}$  the piece? *facit* 5831 pieces and 2  $\text{q}$ .

22. *Item*, in 5831 pieces and 2  $\text{q}$ , at 4  $\text{g}$  2  $\text{q}$  the piece, how many Marks? *facit* 164 Marks.

23. *A.* oweth the following sum of money, to wit, 124 £ 13  $\beta$  6  $\text{g}$ , 344 £ 16  $\beta$  6  $\text{g}$ , and 350 £ 10  $\beta$  6  $\text{g}$ , how many Rixdollers at 4  $\beta$  2  $\text{g}$  the piece, must he pay for the whole debt? *facit* 3936 Rixdollers and 6  $\text{g}$ .

24. *Item*, *A.* oweth 624 £ 3  $\beta$  8  $\text{g}$ , of which he hath paid at one time 131 £ 17  $\beta$  6  $\text{g}$ , at another time 56 £ 13  $\beta$  4  $\text{g}$ , and last of all 87 £ 12  $\beta$  10  $\text{g}$ ; the question is, how many Nobles he owes still? *facit* 924 Nobles.

25. *Item*, A Marchant hath 2467 Duckets, worth 4  $\beta$  4  $\text{g}$  the piece; how many French Crowns at 5  $\beta$  6  $\text{g}$ , or Royals at 9  $\beta$  8  $\text{g}$ , or Nobles at 6  $\beta$  8  $\text{g}$  the piece, may he receive for the said Duckets? *facit* 1943 French Crowns and 3  $\beta$  10  $\text{g}$ , or 1105 Royals and 8  $\beta$  8  $\text{g}$ , or else 1603 Nobles and 3  $\beta$  8  $\text{g}$ .

*Reduction by Multiplication and Division.*

Note, Though the foregoing questions are sufficient to shew the Learners how to work this Rule, yet the following questions are here added as a preparation to the Rule of Three.

26. If 1 Yard of Cloth cost 6  $\beta$ , what cost 28 Yards? *facit* 8  $\mathcal{L}$  8  $\beta$ .

|      |         |       |                               |
|------|---------|-------|-------------------------------|
| Yard | $\beta$ | Yards |                               |
| 1    | 6       | 28    |                               |
|      |         | 6     | 168 $\beta$                   |
|      |         | —     | 268 8 $\mathcal{L}$ 8 $\beta$ |
|      |         |       | 20   <i>Facit.</i>            |

27. *Item*, if 1 lb cost 6  $\beta$ , what cost 148 lb? *facit* 44  $\mathcal{L}$  8  $\beta$ .

28. *Item*, if 148 lb cost 44  $\mathcal{L}$  8  $\beta$ , what cost 1 lb? *facit* 6  $\beta$ .

29. *Item*, if 1 Ell cost 15  $\mathcal{G}$ , what cost 39 Ells? *facit* 48  $\beta$  9  $\mathcal{G}$ .

30. *Item*, if 39 Ells cost 48  $\beta$  9  $\mathcal{G}$ , what cost 1 Ell? *facit* 15  $\mathcal{G}$ .

31. *Item*, if 1 ounce cost 3  $\mathcal{Q}$ , what cost 87 ounces? *facit* 5  $\beta$  5  $\mathcal{G}$  1  $\mathcal{Q}$ .

32. *Item*, if 87 ounces cost 5  $\beta$  5  $\mathcal{G}$  1  $\mathcal{Q}$ , what cost 1 ounce? *facit* 3  $\mathcal{Q}$ .

33. *Item*, if 1 yard cost 4  $\beta$  6  $\mathcal{G}$ , what cost 325 yards? *facit* 73  $\mathcal{L}$  2  $\beta$  6  $\mathcal{G}$ .

34. *Item*, if 325 yards cost 73  $\mathcal{L}$  2  $\beta$  6  $\mathcal{G}$ , what cost 1 yard? *facit* 4  $\beta$  6  $\mathcal{G}$ .

35. *Item*, if 1 yard cost 3  $\mathcal{G}$  3  $\mathcal{Q}$ , what cost 112 yards? *facit* 35  $\beta$ .

36. *Item*, if 112 yards cost 35  $\beta$ , what cost 1 yard? *facit* 3  $\mathcal{G}$  3  $\mathcal{Q}$ .

37. *Item*,

# Reduction by Multiplication and Division.

197

37. *Item*, if 1 lb cost 4 s, what cost the hundred (or 112 lb)? *facit* 37 s 4 d.

38. *Item*, if 1 C cost 37 s 4 d, what cost 1 lb? *facit* 4 d.

39. *Item*, if 1 yard cost 4 s 8 d 2 q, what cost 64 yards? *facit* 15 L 1 s 4 d.

40. *Item*, if 64 yards cost 15 L 1 s 4 d, what cost 1 yard? *facit* 4 s 8 d 2 q.

41. *Item*, if 1 lb cost 2 L 16 s 8 d, what cost 58 lb? *facit* 164 L 6 s 8 d.

42. *Item*, if 58 lb cost 164 L 6 s 8 d, what cost 1 lb? *facit* 2 L 16 s 8 d.

43. *Item*, if 1 C cost 3 L 0 s 6 d, what cost 13 C? *facit* 39 L 6 s 6 d.

44. *Item*, if 13 C cost 39 L 6 s 6 d, what cost 1 C? *facit* 3 L 0 s 6 d.

45. *Item*, if 1 Gros of Buttons cost 13 s 0 d 2 q, what cost 36 Grosses? *facit* 23 L 9 s 6 d.

46. *Item*, if 36 Grosses of Buttons cost 23 L 9 s 6 d, what cost 1 Gros? *facit* 13 s 0 d 2 q.

47. *Item*, if 27 Hogsheads of Commodities cost 263 L 6 s 8 d 1 q, what cost 1 Hogshead? *facit* 9 L 15 s 0 d 3 q.

48. *Item*, if 9 L 15 s 0 d 3 q be paid for 1 Hogshead, what cost 27 Hogsheads? *facit* 263 L 6 s 8 d 1 q.

49. *Item*, if 1 yard cost 12 s 6 d, how many yards will 51 L 17 s 6 d buy? *facit* 83 yards.

50. *Item*, if 83 yards cost 51 L 17 s 6 d, how many yards will 12 s 6 d buy? *facit* 1 yard.



## Questions of Reduction.

Quest. 1. **VV** *What is Reduction?*

*Ans.* Reduction is a changing a number from one denomination unto another.

Quest. 2. *In how many parts is Reduction divided?*

*Ans.* Some divide it into two parts, some into three.

Quest. 3. *What is the first part of Reduction?*

*Ans.* The first part of Reduction is called Reduction by Multiplication, or Reduction Descending.

Quest. 4. *Why is it so called?*

*Ans.* Because it teacheth to reduce, Moneys, Weights, Measures, Time, &c. from a great denomination, into a lesser, which is performed by Multiplication.

Quest. 5. *What is your general rule in working this Reduction?*

*Ans.* The general rule is to consider, how many of the less denominations make one of the greater, and then multiply the one by the other.

Quest. 6. *Give an example.*

*Ans.* Suppose that a number of Pounds were to be reduced into Shillings, I must (according to the rule) multiply the number of Pounds by 20, because 20 shillings make 1 pound, saying, (in setting the numbers) If 1 Pound be 20 shil-  
lings;

lings, how many Shillings amount so many Pounds.

Quest. 7. *How many numbers or denominations do you set down?*

Ans. I set three for order sake.

Quest. 8. *What advantage have you in setting three numbers, when two will serve?*

Ans. This order is profitable in two things.

Quest. 9. *What are they?*

Ans. First, in setting the three numbers I set 1 first, saying, If 1 £ makes 20 s, how many shillings make so many pounds? the very setting of the numbers, in this order, shews the reason, why I must multiply by 20 (which is, because 20 s make 1 £) which is very profitable to observe by new Learners.

Quest. 10. *What further advantage is there in following this order?*

Ans. In following such method, saying, at every question propounded; If 1 be worth (or contain) so many small pieces, what so many, &c. The Learner (by this means) comes to be acquainted with the phrase used in the *Rule of Three*, which will make that rule the more easie to him, when he comes to it.

Quest. 11. *How will you reduce shillings to pence?*

Ans. I must multiply the number of shillings by 12, because 12 s make 1 £.

Quest. 12. *How do you reduce pence into farthings?*

Ans. I must multiply the number of pence

## Of Reduction.

by 4, because 4 q make 1  $\text{ſ}$ : But to avoid multiplicity of questions, the Table of this Reduction (*Fol.* 173: 174: 175: and 176:) is a sufficient direction how to answer most questions of this nature, concerning Weights and Measures, &c.

*Quest.* 13. *How do you reduce pounds into  $\text{ſ}$  or q?*

*Ans.* The said Table directs you to reduce the pounds first to shillings, and the  $\text{ſ}$  produced into  $\text{ſ}$ , and the pence into farthings.

*Quest.* 14. *How will you reduce  $\text{L}$  into  $\text{ſ}$ , at one operation?*

*Ans.* I must multiply the number of  $\text{L}$  by 240, because 240  $\text{ſ}$  make 1  $\text{L}$ .

*Quest.* 15. *How do you reduce  $\text{L}$  into q at one operation?*

*Ans.* I must multiply the  $\text{L}$  by 960, because 960 q make 1  $\text{L}$ .

*Quest.* 16. *Is it always the best way to reduce  $\text{L}$  into  $\text{ſ}$  or q, at one operation?*

*Ans.* No; for when a Compound number is to be reduced into  $\text{ſ}$  or q, that way is more troublesome for the Learner, then the other.

*Quest.* 17. *Show the difference by an example.*

*Ans.* Suppose that 8  $\text{L}$  17  $\text{ſ}$  were given to be reduced into  $\text{ſ}$ , the easiest way is to reduce the 8  $\text{L}$  into  $\text{ſ}$  first, taking in the 17  $\text{ſ}$ , then the *Product* being multiplied by 12. produceth  $\text{ſ}$ .

*Quest.* 18. *How will you reduce the said 8  $\text{L}$  17  $\text{ſ}$  into  $\text{ſ}$ , the other way?*

*Ans.* I must make two *Multiplications*, and adde the *Products* together.

*Quest.*



## Of Reduction.

only, (as 12  $\mathcal{L}$  0  $\beta$  0  $\mathcal{Q}$  2  $q$ ) into  $q$ ?

*Ans.* I multiply the  $\mathcal{L}$  by 20, and the *Product* by 12 (as before) then in multiplying the second *Product* (vvhich are pence) by 4, I take in the odde  $q$ .

*Quest.* 23. *What observation or rule have you in taking in the odde money of any Compound number givento be reduced?*

*Ans.* The general rule is this, In multiplying the number of  $\mathcal{L}$  by 20 (to bring them into  $\beta$ ) I take in the odde  $\beta$  (if there be any) then in multiplying the *Product* by 12 (to bring the  $\beta$  into  $\mathcal{Q}$ ) I take in the odde  $\mathcal{Q}$  (if I finde any;) lastly, In multiplying the second *Product* by 4, (to bring  $\mathcal{Q}$  to  $q$ ) I take in the odde  $q$ , if any odde  $q$  be there.

*Quest.* 24. *How will you reduce Pounds into Crowns?*

*Ans.* I multiply the  $\mathcal{L}$  by 4, because 4 Crowns make 1  $\mathcal{L}$ .

*Quest.* 25. *How do you reduce Pounds into Nobles?*

*Ans.* I multiply by 3, because 3 Nobles make 1  $\mathcal{L}$ .

*Quest.* 26. *How do you reduce Nobles into Pence.*

*Ans.* I must multiply the Nobles by 80, because the vvorh of 1 Noble in  $\mathcal{Q}$ , is 80  $\mathcal{Q}$ , or 6  $\beta$  8  $\mathcal{Q}$ .

*Quest.* 27. *How will you reduce Marks into Pence?*

*Ans.* A Mark is 13  $\beta$  4  $\mathcal{Q}$ , or 160  $\mathcal{Q}$ , therefore



therefore I must multiply the number of Marks by 160.

Quest. 28. *How do you reduce Half crowns into Pence?*

Ans. In multiplying the number of Half crowns by 30, because 30 s is 1 Half crown.

Quest. 29. *How do you reduce great weight into a smaller denomination?*

Ans. I must observe the Rule before-mentioned in the answer of the fifth question.

Quest. 30. *What rule is that?*

Ans. To observe how many of the lesser denomination, make one of the greater, and then multiply these two numbers together.

Quest. 31. *Will this rule serve for all sorts of weights and Measures?*

Ans. Yes; as the forementioned Table of Reduction (in Fol. 173: 174, &c.) sufficiently shews; to which, I refer you for the reducing of any Weight or Measure.

Quest. 32. *I shall ask but one question more about this Reduction, which may serve for an example for the rest?*

Ans. If you please to propound, I am ready to answer.

Quest. 33. *How will you reduce 97 C 3 qrs. 27 lb 15 ounce. 7 drams 2 scruples and 19 grains, into grains?*

Ans. I must multiply first the 97 C by 4, and take in the 3 qrs, then the Product by 28, and take in the 27 lb, the Product (which are lb) I must multiply by 16, taking in the 15 ounces; the

the *Product* (which is ounces) I multiply by 8, taking in the 7 drams; the *Product* (which is dram) I multiply by 3, taking in the 2 scruples; the *Product* (which are scruples) I multiply by 20, taking in the 19 grains; the last *Product* is 84295679 grains for the *facit*.

Quest. 34. *What is the second Part of Reduction?*

Ans. The second Part of *Reduction* is called *Reduction by Division*, or *Reduction Ascending*.

Quest. 35. *Why is it so called?*

Ans. Because it teacheth to reduce a number of a lesser denomination (either Money, Weight, or Measure, &c.) into a greater, which is performed by *Division*.

Quest. 36. *What is your general rule in this Reduction?*

Ans. The general rule is to observe how many pieces of the lesser denomination make one of the greater, required; and that number of smaller denomination is the *Divisor*.

Quest. 37. *Give an example.*

Ans. Suppose that a quantity of shillings were given to be reduced into pounds, I divide then the shillings by 20, because 20 s makes 1 £, saying, (in setting the numbers) if 20 s make 1 £; how many £ will so many s make?

Quest. 38. *This Rule seems to be the Proof of the former part of Reduction; is it not?*

Ans. Yes; these two parts of *Reduction* prove one another; and I observe the same order in

in this part, as in the former.

Quest. 39. *Do you set down three numbers in this part of Reduction, in the very same manner as in the former?*

Ans. There is a little difference in respect of placing the three numbers, but they agree in this general observation, that the first number and the third, must be of one denomination.

Quest. 40. *Wherein do they differ in respect of placing the three numbers?*

Ans. In the first part of *Reduction*, the worth of one piece is always set down in the second place, and one in the first; but in this second part, the worth of one piece is always set down first, and one in the second place.

Quest. 41. *Is there no more difference to be observed between these two parts of Reduction?*

Ans. Yes; I observe that in the first part of *Reduction*, I multiply always the last number by the second; but in this second part, I must always divide the last number by the first, which observation is worthy to be minded by the Learner; for in so doing the *Rule of Three* will not seem so strange to him.

Quest. 42. *How do you reduce Pence into Shillings?*

Ans. Pence are reduced into shillings, by dividing by 12, because 12  $\text{p}$  make 1  $\text{s}$ .

Quest. 43. *How do you reduce Farthings into Pence?*

Ans. In dividing the  $\text{q}$  by 4, because 4  $\text{q}$  makes 1  $\text{p}$ , as you may see in the Table of this  
Reduction

*Reduction* (Fol. 184: 185: and 186,) which shews also how to reduce all sorts of Weights and Measures, from a lesser denomination into a greater, to whom I refer you for brevity sake.

Quest. 44. *How will you reduce Pence into Pounds?*

Ans. That may be done two ways, either a one working, or in two.

Quest. 45. *In what manner?*

Ans. In dividing the number of  $\text{q}$  by 240 (because 240  $\text{q}$  make 1  $\text{L}$ ) the Quotient is  $\text{L}$  the Rest is  $\text{q}$ .

Quest. 46. *What is the other way?*

Ans. The other way is, to divide the number of  $\text{q}$  first by 12, to reduce the  $\text{q}$  to  $\text{s}$ , and then divide the  $\text{s}$  by 20, to reduce them to  $\text{L}$ .

Quest. 47. *But in dividing more then once (in reducing  $\text{q}$  to  $\text{L}$ ) if you finde some Remainders, how do you call them?*

Ans. In dividing  $\text{q}$  by 12 (to bring them into  $\text{s}$ ) if there be any Rest in the Division, such Rest is  $\text{q}$ ; and in dividing the  $\text{s}$  by 20 (to bring them into  $\text{L}$ ) the Rest of such Division is  $\text{s}$ .

Quest. 48. *How do you reduce Farthings into Pounds?*

Ans. That may be performed two ways; the first is to divide the number of  $\text{q}$  by 960 (because 960  $\text{q}$  make 1  $\text{L}$ ) the Quotient is  $\text{L}$ , and the Rest (if there be any) is  $\text{q}$ .

Quest. 49. *What is the second way?*

Ans. The second way is to divide the number of  $\text{q}$  first by 4, (to bring  $\text{q}$  into  $\text{d}$ ) the Quo-

ient by 12 (to bring 9 into  $\beta$ ) and the second Quotient being divided by 20, the third Quotient is  $\mathcal{L}$ .

Quest. 50. Have you no other way to reduce shillings into pounds, but by dividing the  $\beta$  by 20, according to the common Division?

Ans. Yes; there is another way which is shorter, but yet it is still the same for substance; for it is by dividing by 20, in a shorter manner, then the common way.

Quest. 51. Explain it in few words.

Ans. There is nothing else to do, but to cut off the last figure towards the right hand, and to take the half of the Resting figures which are on the left.

Quest. 52. Give an example or two to make that plain and evident.

Ans. Suppose that 865  $\beta$  were given to be reduced into  $\mathcal{L}$ , I cut off the 5, and draw a line under the number of  $\beta$  thus  $86\overline{5}$ , and I take the half of 86, beginning at the 8, saying, the half of 8 is 4, and the half of 6 is 3; then coming so far as the line of Separation, I set the Character of Pounds (which is  $\mathcal{L}$ ) and the figure 5 cut in the place of  $\beta$ , as followeth.

$$\begin{array}{r} 86\overline{5} \beta \\ \text{Facit } 43 \mathcal{L} \ 5 \beta \end{array}$$

Quest. 53. This way is short enough, but if the figures on the left hand were odde, as 73 instead of 86; how will you then take the half?

Ans. In such a case I must set down the lesser



lesser half of the first figure, towards the left hand, and the remaining must be accounted for 10, to be added to the next figure, and then take the half again of such sum.

Quest. 54. Give an example of that.

Ans. Suppose that 734  $\beta$  were given to be reduced to  $\mathcal{L}$ 's, I cut the last figure as before, thus, 734, then I take the half of the other figures in this manner: The half of 7 is 3, there remains 1 (which is 10) and 3 is 13; then the half of 13 is 6, there remains 1, which I is 10  $\beta$ , and the 4 (which is cut off) is 14  $\beta$ ; the sum is then in pounds, 36  $\mathcal{L}$  14  $\beta$ , as followeth.

$$\begin{array}{r} 734 \\ \hline \text{Facit } 36 \mathcal{L} \ 14 \beta \end{array}$$

Quest. 55. How will you reduce Shillings into Crowns?

Ans. By dividing the number of  $\beta$  by 5, because 5  $\beta$  make 1 Crown.

Quest. 56. How do you reduce Pence into Nobles?

Ans. In dividing the number of pence by 80, because 80  $\text{d}$  make 1 Noble.

Quest. 57. How will you reduce Farthings into Marks?

Ans. In dividing the number of  $q$  by 640, because a Mark is 640  $q$ , or 13  $\beta$  4  $\text{d}$ .

Quest. 58. Before we speak of the next part of Reduction, I shall ask one question more, which is this, whether you have not a general observation upon these two parts of Reduction before mentioned?

Ans.

*Ans.* Yes ; the general observation is, when any great denomination is to be reduced into a lesser, that is always performed by *Multiplication* : But on the contrary, to reduce lesser denominations into greater, this is performed by *Division*.

*Quest.* 59. *Is there any more parts in Reduction ?*

*Ans.* Yes.

*Quest.* 60. *How do you call it ?*

*Ans.* *Reduction by Multiplication and Division*, and contains the two former parts.

*Quest.* 61. *Is there need of such Reduction before you come to the Rule of Three ?*

*Ans.* Yes ; it serveth as an Introduction to it.

*Quest.* 62. *What doth the third part of Reduction teach ?*

*Ans.* It teacheth to reduce one kinde of denomination into another.

*Quest.* 63. *What do you mean by that, seeing the two former parts teach the same thing : Where is the difference ?*

*Ans.* The questions which belong to the first part, or to the second, are answered either by *Multiplication* or *Division* ; but the questions that belong to this third part, are performed by *Multiplication* and *Division*.

*Quest.* 64. *Give some examples.*

*Ans.* Suppose that 63 Marks were given to be reduced into pounds, that cannot be answered by *Multiplication* onely, or by *Division* alone, but both must be used.

P

*Quest.*

Quest. 65. *Which way?*

*Answ.* I multiply the Marks by 2, to reduce them to Nobles (because 2 Nobles make a Mark) then I divide the Nobles by 3. (because 3 Nobles makes 1  $\mathcal{L}$ ) to reduce them to  $\mathcal{L}$ .

Quest. 66. *I perceive now that the questions of this nature requires Multiplication and Division, but have you a general rule how to work such questions?*

*Answ.* Yes, the Rule to be observed is much like to that of the Rule of Three.

Quest. 67. *Declare the Rule briefly.*

*Answ.* When any question is propounded, the first thing to be minded, is to observe what kinde of money or pieces the question requires; which being known, there are four things more to be well observed.

Quest. 68. *Which are they?*

*Answ.* I must set three numbers in order, but to prevent mistakes, I set first 1 in the second place (or in the middle) which 1 bears the same name of that kinde of specie (or pieces) required: Secondly, I set the worth of that 1 in the first place. Thirdly, the number propounded in the third place.

Quest. 69. *When the three numbers are placed, what do you observe further?*

*Answ.* I observe whether the first and third number be of like denomination, and if they be not, I must reduce them into the same denomination or name by *Multiplication*.

Quest. 70. *What do you further?*

*Answ.*

*Ans.* When the first and third number be, reduced into one and the same denomination then there is nothing else to do, but to divide the last (or third) number by the first, and the *Quotient* is the number required.

*Quest. 71.* Give an example to explain your meaning?

*Ans.* Suppose that it were required to reduce 364 Ninepences into Groats, I observe that the pieces required are Groats, therefore I set down 1 Groat in the second place, and the worth of it (which is 4 9) in the first; then I set down the 364 Ninepences in the third place, as followeth.

|   |       |             |
|---|-------|-------------|
| 9 | Groat | Ninepences. |
| 4 | — 1 — | 364.        |

*Quest. 72.* Go on and finish the working of that question.

*Ans.* The three numbers being in such order, I perceive that the first number is 9, and the third is Ninepences; therefore I must multiply the 364 Ninepences by 9 (because 9 9 is the worth of each piece) to reduce them into 9 (which is of the same name as the first number is) the *Product* will be 3276 9; which number being divided by the first (which is 4) the *Quotient* will be 819 Groats; which is the answer of the question, as followeth.

| 9    | Groat       | Ninepences. |
|------|-------------|-------------|
| 4    | 1           | 364         |
| 3    |             | 9           |
| 3276 | (819 Groats | 3276 9      |
| ###  |             |             |

Quest. 73. *Must you of necessity follow always such order (or form) in every question?*

Answ. No; there is no necessity to follow always that form of setting the three numbers, for there is another form which is as good, though it be a little longer.

Quest. 74. *What form is that?*

Answ. It is the same form used in the two former parts of *Reduction*.

Quest. 75. *Then you must make use of six numbers.*

Answ. Yes; but yet in so doing, I neither multiply, nor divide oftner then in this way before mentioned.

Quest. 76. *Work this way the forementioned question, which is to reduce 364 Ninepences into Groats.*

Answ. I reduce the 364 Ninepences into 9 (by the first part of *Reduction*) saying, if 1 piece makes 9 9, what 364 pieces, and by multiplying I finde 3276 9; then I say further (by the second part of *Reduction*,) if 4 9 makes 1 Groat, what 3276 9? and by dividing by 4, I finde 819 Groats, which is the answer of the question, the work followeth.

Piece



|       |       |        |
|-------|-------|--------|
| Piece | 9     | Pieces |
| 1     | 9     | 364    |
|       |       | 9      |
| 9     | Groat |        |
| 4     | 1     | 3276 9 |

<sup>3</sup>  
3276 (819 Groats.  
444

Quest. 77. *I perceive that these two manner of working, are much like one another, but do you use always one way (or form) in answering every question that belongs to the third part of Reduction?*

Answ. No.

Quest. 78. *What way do you like best?*

Answ. I do not tie my self to one way, for I use sometimes one, and sometimes the other; which I judge to be the most convenient for the answering the questions propounded.

Quest. 79. *Do you not finde that a tedious thing to set down always six numbers, or else three, to work out every question?*

Answ. I confess, that sometimes being in haste, I set down but two numbers in any part of Reduction: But I wish the Learner to follow the order and method before mentioned, to make him the more perfect to understand the Reasons of his working, which having obtained, he may afterward use as much brevity as he pleaseth.

*The Rule of Three direct.*

Quest. 80. What is the next Rule to be spoken unto?

Ans<sup>w</sup>. The Rule which follows *Reduction* is, The Rule of Three, called The Golden Rule.

*The Rule of Three direct,*  
CALLED  
*The Golden Rule.*

**T**His Rule is so called, because three numbers are required in its operation, to finde a fourth in a direct proportion.

This Rule is the chiefeſt in *Arithmetick*, and therefore is called *The Golden Rule*; it deserves then to be well minded by the Learner, because it is that Rule, upon which the other Rules do stand; therefore I shall enlarge the more upon it.

In this Rule, the first number bears such proportion to the second, as the third doth to the fourth; or thus, As the first number is to the third, so is the second to the fourth: As for example.

These four numbers, to wit; 6, 3, 18 and 9, are in a direct proportion; for, as 6 is to 3, so is 18 to 9, which is a double proportion: Or thus, As 6 is to 18, so is 3 to 9, &c.

Before I mention how to finde such a fourth number

number proportional, when three numbers are propounded, I shall first acquaint the Learner, how to place the three numbers, which is one of the chiefest things to be observed in this Rule.

*How to place the three Numbers.*

**I**N the *Rule of Three*, the three numbers propounded, are commonly of two general denominations; two of which have the same name, and the other, with the number required, have another name; that is to say, that in the three numbers, there is commonly twice Money, Weight, or Measure, &c. named, and once another name different from the two others, which is of the same general denomination with the fourth number required, as appears by the following question.

*What will cost 25 Yards, if 5 Yards cost 3 £?*

In this question you see two different denominations (to wit, Length and Money) in the three numbers; two whereof are Yards, and one is pounds sterling. Now for the right ordering of the three numbers of any question, (though the three numbers be never so confusedly propounded) observe the following Directions.

I. When any question is propounded, the first thing to be considered is, What the question doth demand, either, Length, Money, or Weight,

P 4

&c.

*&c.* Which thing being known, you are to take notice, that one of the three numbers bears the same name (general or particular, that is to say Money, or Pounds, or Shillings, Pence, *&c.*) which number must be in the second place, (or in the middle of the two others;) as for example, The forementioned question requires Money (to wit, what 25 Yards cost) therefore the 3 *£* must be in the second place (or in the middle of the two others) though the said Money was last named in the question; for the three numbers are not to be always placed, as they are given in the question, because they are sometimes confusedly propounded.

I I. Being acquainted with the number that must possess the second place; observe further, that one of the two others is of equal value (though not of the same name) with the said second number, which number must be in the first place; as in the forementioned question, the 3 *£* is the second number, then 5 Yards must be in the first place, because it is equal in value with the said 3 *£*.

I I I. The two first numbers being placed, the third number (which is that number upon which the question is moved) must possess the third (or last) place, as in the question before mentioned. It is required, to know what 25 Yards cost: therefore 25 Yards must be in the last (or third) place, though it be first named in the question.

I V. Having placed the three numbers in their right places, you must further observe, whether the

the first and last number be both of one particular name, as Pounds, Yards, Ells, &c. if they be not, reduce them as followeth.

If one be of a lesser denomination, then the other number, (that is, if one number be Pounds, and the other Shillings, or Pence, or Farthings; or the one be Pounds, and the other Ounces, or Drams, &c.) then reduce the greater denomination into the same name, as the lesser is.

Further, if one of the numbers (to wit, the first or the third) or both, be a compound number (as  $\mathcal{L}$ ,  $\beta$ ,  $\text{q}$ , or  $\text{ss}$ , Ounces, Drams, &c.) then reduce them both into the least denomination, mentioned in either number, that is, If one number (the first or the third) be onely  $\mathcal{L}$ , and the other  $\mathcal{L}$ ,  $\beta$ ,  $\text{q}$ , then both the numbers must be reduced into  $\text{q}$ , or both into  $\text{ss}$  onely; if the least denomination in any of these two numbers be  $\text{ss}$ .

V. Having reduced the first and third numbers into one particular denomination (if you see it needful to reduce them so) then go to the second number, and see whether it be single or compound; if it be single, do as is taught in the sixth Direction following, but if the said second number be compound, (or of more denominations then one) then reduce it into the least denomination, mentioned in the said number; that is, if the said number consist of Pounds, Shillings, Pence, reduce it into Pence; but if there be any Farthings, then reduce it into Farthings; or else, if the said second number, consist of Pounds, Ounces,



Ounces, Drams, then reduce it into Drams, &c.

V I. Having placed the three numbers in the right places, and reduced them, as is taught before; then for to finde the fourth number proportional required, the general Rule is as followeth.

*Multiply the second number by the third (or the third by the second) and divide the Product by the first; the Quotient is the fourth number required.*

As for example, If these three numbers 6, 3, and 18, be given to finde a fourth in a Direct proportion; Multiply 18 by 3, the *Product* is 54; which being divided by 6, the *Quotient* is 9, for the fourth number required.

VII. Observe further, That the *Product* of the *Multiplication* of the second and third number, being divided by the first, the *Quotient* (or fourth number) is always of the same name with the second number (or of the same name that the second number is reduced of) that is to say, If the second number be  $\mathcal{L}$ , the said *Quotient* is  $\mathcal{L}$ ; if it be  $\beta$ ,  $\mathcal{Q}$ , or  $q$ , then the said *Quotient* is also  $\beta$ ,  $\mathcal{Q}$ , or  $q$ , &c. Now observe also, that if you finde that the said *Quotient* answereth the question directly, in such denomination required, then the work is wholly finished, that is, if the question requires  $\mathcal{L}$ , and that the *Quotient* be  $\mathcal{L}$  (because the second number is  $\mathcal{L}$ ) then you have the number required at the first *Division*. But if you finde that the said *Quotient* is but Shillings

Shillings, Pence, or Farthings, (because the second number is (or is so reduced) of such small denominations) then reduce such lesser denominations into Pounds, if their quantity will permit it.

Further, if you finde the second number to be Pound weight, and that the question requires such denomination as *lb*, then the *Quotient* will answer the question. But if the said *Quotient* is found to be but Ounces, or Drams, &c. (because the second number is of such small denomination) then reduce such *Quotient* (which is a lesser weight then the question requires) into Pounds, if the quantity of small weight will permit it: Do the like in other denominations, as Yards, Ells, or other Measures.

VIII. If any of the three numbers be but an unite (which neither multiply nor divide) then the work is the sooner ended: For, if the first number be but 1, then you need not to divide by it; but the *Product* arising from the two last numbers, is the fourth number sought.

Further, if the second or third number be but 1, then you need not to multiply them together, but divide the second or last number, by the first, and the *Quotient* is the fourth number required.

IX. Lastly, if you finde that the *Product* arising from the *Multiplication* of the second and third number, cannot be divided by the first number; or that the *Quotient* of such *Division* cannot afford an Unite, (by reason the *Divisor* is greater then the *Dividend*) then reduce the second number

*The Rule of Three direct.*

number into so small a denomination, that the number produced being multiplied by the third number, their *Product* may be divided by the first: But if you finde after such *Reduction*, that the quantity of the smallest denomination being multiplied by the third number, cannot afford a *Dividend* great enough, to divide it by the first number, then you may conclude, that the answer of such question (or the fourth number sought), cannot be an Unite of such a small denomination, but onely a Fraction of it.

1. *Example.*

If 5 Yards of Cloth cost 3 £, what cost 25 Yards? *facit* 15 £.

| Yards | £     | Yards |                  |
|-------|-------|-------|------------------|
| 5     | — 3 — | 25    |                  |
|       |       | 3     | 2                |
|       |       | —     | 75 (15 £         |
|       |       | 75    | 55 <i>Facit.</i> |

Having placed the three numbers in their right places, I multiply the last number 25 by the second 3, the *Product* is 75, which being divided by 5 (the first number) the *Quotient* is 15 £ for the number required.

Before I propound any more questions, I thought it beneficial for the Learner to know how to make the Proof of his work before he go further; therefore I shall mention in this place, how to prove the *Rule of Three*.

The Proof of the Rule of Three direct.

The Rule of Three direct, may be proved 4 ways (which are very beneficial for the Learner to understand) as followeth.

I. Observe that four numbers being in a direct proportion, the *Product* of the first and fourth number multiplied together, is always equal to the *Product* of the second and third number multiplied together, as followeth.

Take the four numbers of the first question of this Rule, which are 5: 3: 25: and 15. Now multiplying the first and the fourth together, the *Product* will be 75; and multiplying likewise the second and third together, the *Product* is also 75, as followeth.

| First<br>Yards | Second<br>ℓ | Third<br>Yards | And Fourth Number<br>ℓ |
|----------------|-------------|----------------|------------------------|
| 5              | 3           | 25             | 15                     |
|                |             | 3              | 5                      |
|                |             | <hr/>          | <hr/>                  |
|                |             | 75             | equal to 75            |

This Proof is the ground of the other, and therefore it ought to be well observed.

The Second Proof.

Multiply the fourth number by the first, and divide the *Product* by the third, the *Quotient* will be equal to the second.

Or

*The Rule of Three direct.*

Or thus by way of Question.

If 25 Yards cost 15 £, what cost 5 Yards?  
*facit* 3 £, as followeth.

|       |      |       |                    |
|-------|------|-------|--------------------|
| Yards | £    | Yards |                    |
| 25    | — 15 | — 5   |                    |
|       | 5    |       | x                  |
|       | —    |       | 75   3 £           |
|       | 75   |       | 25   <i>Facit.</i> |

*The Third Proof.*

Multiply the third number by the second, and divide the *Product* by the fourth, the *Quotient* will be equal to the first.

Or thus.

If 25 Yards cost 15 £, how many Yards will 3 £ buy? *facit* 5 Yards, as followeth.

|    |       |     |                    |
|----|-------|-----|--------------------|
| £  | Yards | £   |                    |
| 15 | — 25  | — 3 |                    |
|    | 3     |     | x                  |
|    | —     |     | 75   5 Yards       |
|    | 75    |     | 25   <i>Facit.</i> |

*The Fourth Proof.*

Multiply the fourth number by the first, and divide the *Product* by the second, the *Quotient* will be equal to the third.

Or thus.

If 5 Yards cost 3 £, how many Yards will 15 £ buy? *facit* 25 Yards.

£ Yards



| $\mathcal{L}$ | Yards | $\mathcal{L}$ |               |
|---------------|-------|---------------|---------------|
| 3             | — 5 — | 15            | $\times$      |
|               |       | 5             | 75 (25 Yards. |
|               |       | —             | 33 Facit.     |
|               |       | 75            |               |

2. Item, If 7 tb cost 5  $\mathcal{L}$ , what will then cost 35 tb? *facit* 25  $\mathcal{L}$ .
3. Item, If 17 Ells cost 2  $\mathcal{L}$ , what cost 2074 Ells? *facit* 244  $\mathcal{L}$ .
4. Item, If 2 Yards cost 24  $\beta$ , what cost 140 Yards? *facit* 84  $\mathcal{L}$ .
5. Item, If 1 Yard cost 16  $\beta$ , what cost 224 Yards? *facit* 179  $\mathcal{L}$  4  $\beta$ .
6. Item, If 3 tb cost 27  $\text{q}$ , what cost 213 tb? *facit* 7  $\mathcal{L}$  19  $\beta$  9  $\text{q}$ .
7. Item, If 16 tb cost 11  $\mathcal{L}$ , what cost 176 tb? *facit* 121  $\mathcal{L}$ .
8. Item, What will cost 45 Ells, if 9 Ells cost 4  $\mathcal{L}$ ? *facit* 20  $\mathcal{L}$ .
9. Item, What cost 351 Yards, if 3  $\mathcal{L}$  buy 13 Yards? *facit* 81  $\mathcal{L}$ .
10. Item, If 7  $\mathcal{L}$  buy 11 Yards, what cost 209 Yards? *facit* 133  $\mathcal{L}$ .
11. Item, If 15 tb cost 6  $\mathcal{L}$ , how many tb will 102  $\mathcal{L}$  buy? *facit* 255 tb.
12. Item, If 67 Yards cost 21  $\mathcal{L}$ , how many Yards will 189  $\mathcal{L}$  buy? *facit* 603 Yards.
13. Item, How many Ells will 184  $\mathcal{L}$  buy, if 135 Ells cost 23  $\mathcal{L}$ ? *facit* 1080 Ells.
14. Item,

*The Rule of Three direct.*

14. *Item*, If 84  $\text{L}$  be paid for 1620  $\text{lb}$ , how many  $\text{lb}$  will 252  $\text{L}$  buy? *facit* 4860  $\text{lb}$ .

15. *Item*, How many  $\text{lb}$  will 384  $\text{L}$  buy, 24  $\text{L}$  buy 182  $\text{lb}$ ? *facit* 2912  $\text{lb}$ .

16. *Item*, If 888  $\text{lb}$  of Pepper be worth as much as 148  $\text{lb}$  of Cloves, how many  $\text{lb}$  of Pepper will be worth 3487  $\text{lb}$  of Cloves? *facit* 20922  $\text{lb}$  of Pepper.

17. *Item*, If 3487  $\text{lb}$  of Cloves, be worth as much as 20922  $\text{lb}$  of Pepper, how many  $\text{lb}$  of Cloves will be worth 888  $\text{lb}$  of Pepper? *facit* 148  $\text{lb}$  of Cloves.

18. *Item*, What Money must be paid for 64 Yards, if 4 Yards cost 3  $\text{L}$ ? *facit* 48  $\text{L}$ .

19. *Item*, If 4 Yards cost 24  $\beta$ , what cost 47 Yards? *facit* 14  $\text{L}$  2  $\beta$ .

20. *Item*, If 32  $\beta$  be paid for 2 Yards of Cloth, what will cost 2 Pieces, long together 98 Yards? *facit* 78  $\text{L}$  8  $\beta$ .

21. *Item*, What cost 123  $\text{lb}$ , if 3  $\text{lb}$  cost 18  $\text{d}$ ? *facit* 54  $\beta$  8  $\text{d}$ .

22. *Item*, 15  $\text{d}$  buy 3 Yards, what will cost 342 Yards? *facit* 7  $\text{L}$  2  $\beta$  6  $\text{d}$ .

23. *Item*, If 162  $\text{lb}$  cost 2  $\text{L}$  15  $\beta$ , what cost 1458  $\text{lb}$ ? *facit* 24  $\text{L}$  15  $\beta$ .

24. *Item*, If 5  $\text{L}$  19  $\beta$  be paid for 77  $\text{lb}$  what will cost 847  $\text{lb}$ ? *facit* 65  $\text{L}$  9  $\beta$ .

25. *Item*, If 3  $\text{lb}$  cost 7 Farthings, what cost 63  $\text{lb}$ ? *facit* 3  $\beta$  0  $\text{d}$  3  $\text{q}$ .

26. *Item*, What cost 624  $\text{lb}$ , if 4  $\text{lb}$  cost 9  $\text{q}$ ? *facit* 29  $\beta$  3  $\text{d}$ .

27. *Item*

27. *Item*, If 7 lb cost 6  $\beta$  5  $\text{q}$ , what cost  
49 lb? *facit* 2  $\text{L}$  4  $\beta$  11  $\text{q}$ .
28. *Item*, What cost 75 lb, if 5 lb cost  
12  $\beta$  9  $\text{q}$ ? *facit* 9  $\text{L}$  11  $\beta$  3  $\text{q}$ .
29. *Item*, If 3 Yards cost 8 Groats, what cost  
369 Yards? *facit* 16  $\text{L}$  8  $\beta$ .
30. *Item*, What cost 204 Ells, if 4 Ells cost  
14 Groats? *facit* 11  $\text{L}$  13  $\beta$ .
31. *Item*, If 9 lb cost 9  $\text{q}$  2  $\text{q}$ , what cost  
108 lb? *facit* 9  $\beta$  6  $\text{q}$ .
32. *Item*, What cost 240 Yards? if 5 Yards  
cost 16  $\text{q}$  3  $\text{q}$ ? *facit* 4  $\text{L}$  14  $\beta$  11  $\text{q}$ .
33. *Item*, If 116 lb cost 29 Crowns, what  
cost 464 lb? *facit* 29  $\text{L}$ .
34. *Item*, If 34 Crowns be paid for 140 lb,  
what cost 1540 lb? *facit* 93  $\text{L}$  10  $\beta$ .
35. *Item*, If 11 Yards cost 4  $\text{L}$  15  $\beta$  6  $\text{q}$ ,  
what cost 132 Yards? *facit* 57  $\text{L}$  6  $\beta$ .
36. *Item*, What cost 624 Yards, if 208  
Yards cost 12  $\text{L}$  19  $\beta$  4  $\text{q}$ ? *facit* 38  $\text{L}$   
18  $\beta$ .
37. *Item*, If 6  $\text{L}$  0  $\beta$  9  $\text{q}$  buy 21 lb,  
what cost then 147 lb? *facit* 42  $\text{L}$  5  $\beta$   
3  $\text{q}$ .
38. *Item*, If 22 lb cost 19  $\beta$ , how many lb  
will 57  $\beta$  buy? *facit* 69 lb.
39. *Item*, If 24 Yards cost 16  $\beta$ , how many  
Yards will 84  $\text{L}$  buy? *facit* 2520 Yards.
40. *Item*, If 5  $\beta$  buy 13 lb, how many lb  
will be bought for 49  $\text{L}$ ? *facit* 2548 lb.
41. *Item*, How many lb will 64  $\text{L}$  buy, if  
32  $\beta$  buy 96 lb? *facit* 3840 lb.

Q

42. *Item*,

*The Rule of Three direct.*

42. *Item*, If 25 20 Yards cost 84  $\mathcal{L}$ , how many Yards will 16  $\beta$  buy? *facit* 24 Yards.

43. *Item*, How many Ells will 48  $\mathcal{L}$  10  $\beta$  buy, if 22 Ells cost 8  $\mathcal{L}$ ? *facit* 194 Ells.

44. *Item*, How many  $\text{tb}$  will 42  $\mathcal{L}$  10  $\beta$  buy, if 24  $\text{tb}$  cost 3  $\mathcal{L}$ ? *facit* 340  $\text{tb}$ .

45. *Item*, If 3  $\mathcal{L}$  11  $\beta$  buy 120  $\text{tb}$ , how many  $\text{tb}$  will 24  $\mathcal{L}$  17  $\beta$  buy? *facit* 840  $\text{tb}$ .

46. *Item*, If 22 Yards cost 16  $\mathcal{L}$  13  $\beta$ , how many Yards will 83  $\mathcal{L}$  5  $\beta$  buy? *facit* 110 Yards.

47. *Item*, If 7  $\text{tb}$  cost 9  $\text{g}$ , how many  $\text{tb}$  will then 54  $\beta$  buy? *facit* 504  $\text{tb}$ .

48. *Item*, If 14  $\text{g}$  buy 15  $\text{tb}$ , how many  $\text{tb}$  will 42  $\beta$  buy? *facit* 540  $\text{tb}$ .

49. *Item*, if 11  $\text{tb}$  cost 3  $\beta$  6  $\text{g}$ , how many  $\text{tb}$  will 17  $\beta$  6  $\text{g}$  buy? *facit* 55  $\text{tb}$ .

50. *Item*, If 5 Yards cost 6  $\text{g}$ , how many Yards will 7  $\mathcal{L}$  buy? *facit* 1400 Yards.

51. *Item*, If 1400 Yards cost 7  $\mathcal{L}$ , how many Yards will 6  $\text{g}$  buy? *facit* 5 Yards.

52. *Item*, If 6 Ells cost 18  $\text{g}$ , how many Ells will 16  $\mathcal{L}$  8  $\beta$  buy? *facit* 1312 Ells.

53. *Item*, If 15  $\text{tb}$  cost 25  $\text{g}$ , how many  $\text{tb}$  will 4  $\mathcal{L}$  15  $\beta$  buy? *facit* 684  $\text{tb}$ .

54. *Item*, How many  $\text{tb}$  will 9  $\mathcal{L}$  18  $\beta$  4  $\text{g}$  buy, if 3  $\text{tb}$  cost 15  $\text{g}$ ? *facit* 476  $\text{tb}$ .

55. *Item*, If 18  $\text{tb}$  cost 6  $\text{g}$ , how many  $\text{tb}$  will 6  $\mathcal{L}$  15  $\beta$  6  $\text{g}$  buy? *facit* 4878  $\text{tb}$ .

56. *Item*, If 3  $\text{tb}$  cost 2  $\text{q}$ , how many  $\text{tb}$  will 10  $\text{g}$  buy? *facit* 60  $\text{tb}$ .

57. *Item*,

57. *Item*, How many  $\text{lb}$  will  $9\text{ }s\text{ }3\text{ }q$  buy, if  $5\text{ } \text{lb}$  cost  $3\text{ }q$ ? *facit*  $65\text{ } \text{lb}$ .

58. *Item*, if  $600\text{ } \text{lb}$  cost  $3\text{ } \text{L}$ , how many  $\text{lb}$  will  $27\text{ } \text{L}\text{ }18\text{ }s\text{ }6\text{ }d$  buy? *facit*  $5585\text{ } \text{lb}$ .

59. *Item*, If  $48\text{ } \text{lb}$  cost  $8\text{ }s$ , how many  $\text{lb}$  can I buy for  $32\text{ } \text{L}\text{ }16\text{ }s\text{ }8\text{ }d$ ? *facit*  $3940\text{ } \text{lb}$ .

60. *Item*, How many Ells will  $12\text{ } \text{L}\text{ }8\text{ }s\text{ }4\text{ }d$  buy, if  $144\text{ } \text{Ells}$  cost  $2\text{ } \text{L}\text{ }8\text{ }s$ ? *facit*  $745\text{ } \text{Ells}$ .

61. *Item*, If  $6\text{ } \text{Ells}$  cost  $4\text{ } \text{L}\text{ }16\text{ }s\text{ }8\text{ }d$ , how many Ells will  $19\text{ } \text{L}\text{ }6\text{ }s\text{ }8\text{ }d$  buy? *facit*  $24\text{ } \text{Ells}$ .

62. *Item*, If  $3\text{ } \text{L}\text{ }18\text{ }s\text{ }9\text{ }d$  be paid for  $27\text{ } \text{Yards}$ , how many Yards are to be delivered for  $19\text{ } \text{L}\text{ }13\text{ }s\text{ }9\text{ }d$ ? *facit*  $135\text{ } \text{Yards}$ .

63. *Item*, What cost  $12\text{ } \text{ounces}$ , if  $6\text{ } \text{ounces}$  cost  $13\text{ }s\text{ }4\text{ }d$ ? *facit*  $26\text{ }s\text{ }8\text{ }d$ .

64. *Item*, If  $4\text{ }s\text{ }9\text{ }d$  buy  $8\text{ } \text{ounces}$ , what will  $4\text{ } \text{lb}$  cost? *facit*  $38\text{ }s$ .

65. *Item*, If  $4\text{ } \text{lb}$  cost  $38\text{ }s$ , what cost  $8\text{ } \text{ounces}$ ? *facit*  $4\text{ }s\text{ }9\text{ }d$ .

66. *Item*, If  $9\text{ } \text{ounces}$  cost  $37\text{ }s\text{ }10\text{ }d$ , what cost  $27\text{ } \text{lb}\text{ }9\text{ } \text{ounces}$ ? *facit*  $92\text{ } \text{L}\text{ }13\text{ }s\text{ }10\text{ }d$ .

67. *Item*, If  $2\text{ } \text{lb}\text{ }4\text{ } \text{ounces}$  cost  $2\text{ } \text{L}\text{ }16\text{ }s\text{ }6\text{ }d$ , what cost  $11\text{ } \text{lb}\text{ }4\text{ } \text{ounces}$ ? *facit*  $14\text{ } \text{L}\text{ }2\text{ }s\text{ }6\text{ }d$ .

68. *Item*, If  $1\text{ } \text{Dram}$  cost  $2\text{ }s\text{ }5\text{ }d$ , what cost  $2\text{ } \text{lb}$ ? *facit*  $30\text{ } \text{L}\text{ }18\text{ }s\text{ }8\text{ }d$ .

69. *Item*, If  $6\text{ } \text{Drams}$  cost  $3\text{ }s\text{ }9\text{ }d$ , what cost  $12\text{ } \text{lb}$ ? *facit*  $48\text{ } \text{L}$ .

Q 2

70. *Item*,



## The Rule of Three direct.

70. *Item*, What cost 16 lb 8 ounces, if 5 Drams cost 4  $\beta$  7  $\text{q}$ ? *facit* 96  $\text{L}$  16  $\beta$ .

71. *Item*, If 30  $\text{L}$  18  $\beta$  8  $\text{q}$  buy 2 lb what cost 1 Dram? *facit* 2  $\beta$  5  $\text{q}$ .

72. *Item*, If 6 drams cost 3  $\beta$  6  $\text{q}$ , what cost 24 lb 4 ounces 3 drams? *facit* 90  $\text{L}$  12  $\beta$  5  $\text{q}$ .

73. *Item*, If 8 ounces 6 drams cost 8  $\beta$  8  $\text{q}$ , what cost 3 lb 4 ounces 4 drams? *facit* 2  $\text{L}$  12  $\beta$ .

74. *Item*, If 2  $\text{L}$  16  $\beta$  6  $\text{q}$  buy 3 lb 6 ounces 2 drams, what cost 23 lb 11 ounces 6 drams? *facit* 19  $\text{L}$  15  $\beta$  6  $\text{q}$ .

75. *Item*, If 23 lb 11 ounces 6 drams cost 19  $\text{L}$  15  $\beta$  6  $\text{q}$ , what cost 3 lb 6 ounces 2 drams? *facit* 2  $\text{L}$  16  $\beta$  6  $\text{q}$ .

76. *Item*, If 1 lb cost 6  $\text{q}$ , how many lb will 36  $\beta$  6  $\text{q}$  buy? *facit* 73 lb.

77. *Item*, If 1 lb cost 36  $\beta$  4  $\text{q}$ , how many lb will 25  $\text{L}$  8  $\beta$  8  $\text{q}$  buy? *facit* 14 lb.

78. *Item*, If 10 ounces cost 3  $\beta$  4  $\text{q}$ , how many lb will 24  $\text{L}$  16  $\beta$  8  $\text{q}$  buy? *facit* 93 lb 2 ounces.

79. *Item*, If 12 ounces cost 4  $\beta$  9  $\text{q}$ , what quantity of lb will 3  $\text{L}$  1  $\beta$  9  $\text{q}$  buy? *facit* 9 lb 12 ounces.

80. *Item*, If 3 lb 8 ounces, cost 2  $\text{L}$  16  $\beta$  3  $\text{q}$ , how many  $\text{ss}$  will 30  $\text{L}$  18  $\beta$  9  $\text{q}$  buy? *facit* 38  $\text{ss}$  8 ounces.

81. *Item*, If 4 drams cost 8  $\text{q}$ , how many  $\text{ss}$  will 12  $\text{L}$  4  $\beta$  10  $\text{q}$  buy? *facit* 11  $\text{ss}$  7 ounces 5 drams.

9 drams

9 Dra. £ β 9  
8—4—12—4—10

20

244

12

488

245

2938

4

11752

357

21752 (1469 Drams.

8888

62(5 2(7

2469 (283 (11 6 7 oun.

888 266 and 5 drams.

Facit.

82. Item, How many £ will 50 £ 0 β 5 9 buy, if 6 drams cost 2 β 6 9? facit 18 6 12 ounces 1 dram.

83. Item, If 4 ounces 3 drams cost 4 β 8 9, how many £ will 3 £ 19 1/2 4 9 buy? facit 4 6 10 ounces 3 drams.

84. Item, if 23 6 11 ounces 6 drams cost 19 £ 15 β 6 9, how many £ will 2 £ 16 β 6 9 buy? facit 3 6 6 ounces 2 drams.

85. Item, How many £ will 9 £ 17 β 9 9 buy, if 6 6 12 ounces 4 drams cost 5 £ 13 β? facit 11 6 13 ounces 7 drams

86. Item, If 1 6 of Cheese cost 3 9, what cost a hundred weight? facit 28 β.

87. Item, If 4 9 buy 1 6 of Cheese, what cost 9 C 2 quarters? facit 17 £ 14 β 8 9.

Q3

88. Item,

# The Rule of Three direct.

88. *Item*, If 1  $\text{æ}$  cost 9  $\text{q}$ , what cost 8  $\text{c}$  3 quarters and 5 pounds? *facit* 36  $\text{L}$  18  $\text{ß}$  9  $\text{q}$ .

89. *Item*, If 1 quarter cost 2  $\text{L}$  10  $\text{ß}$ , what cost 12  $\text{C}$  1 quarter? *facit* 122  $\text{L}$  10  $\text{ß}$ .

90. *Item*, If 3  $\text{L}$  16  $\text{ß}$  buy 3 quarters, what cost then 13  $\text{C}$  2 quarters and 21 pounds? *facit* 69  $\text{L}$  7  $\text{ß}$ .

91. *Item*, If 2  $\text{C}$  1 quarter 10  $\text{æ}$  cost 50  $\text{L}$  0  $\text{ß}$  7  $\text{q}$ , what cost 28  $\text{C}$  0 quarter 8 pounds? *facit* 600  $\text{L}$  7  $\text{ß}$ .

92. *Item*, If 1  $\text{C}$  cost 2  $\text{L}$  16  $\text{ß}$ , what cost 9  $\text{C}$  3 quarters 10 pounds? *facit* 27  $\text{L}$  11  $\text{ß}$ .

93. *Item*, If 1  $\text{C}$  cost 3  $\text{L}$  0  $\text{ß}$  8  $\text{q}$ , what cost 15  $\text{C}$  2 quarters 14 pounds? *facit* 47  $\text{L}$  7  $\text{ß}$  11  $\text{q}$ .

94. *Item*, If 1  $\text{æ}$  of Cheese cost 3  $\text{q}$ , what cost 1 Wey, or 256 pounds? *facit* 3  $\text{L}$  4  $\text{ß}$ .

95. *Item*, If 8  $\text{æ}$  of Cheese cost 2  $\text{ß}$  6  $\text{q}$ , what cost 6 Weys 11 Cloves? *facit* 25  $\text{L}$  7  $\text{ß}$  6  $\text{q}$ .

*Note*, 1 Wey is 32 Cloves, and 1 Clove is 8 pounds.

96. *Item*, If 10  $\text{q}$  be paid every day, what will be paid in a year? *facit* 15  $\text{L}$  4  $\text{ß}$  2  $\text{q}$ .

97. *Item*, What must be paid in 12 years, if 6  $\text{ß}$  9  $\text{q}$  be paid weekly? *facit* 210  $\text{L}$  12  $\text{ß}$ .

*Note*, 1 Year is counted for 52 Weeks.

98. *Item*, If 40  $\text{æ}$  cost 64  $\text{L}$ , what cost 1  $\text{æ}$ ? *facit* 32  $\text{ß}$ .

99. *Item*, If 75  $\text{L}$  be paid for 360  $\text{æ}$ , what cost 12 pounds? *facit* 2  $\text{L}$  10  $\text{ß}$ .

100. *Item*,

100. *Item*, If 24 Yards cost 1 £ 12 β, what cost 1 Yard? *facit* 16 q.

101. *Item*, If 162 lb cost 13 £ 10 β, what cost 1 pound? *facit* 20 q.

102. *Item*, if 987 pieces of Sails cost 2632 £, what cost 1 piece? *facit* 2 £ 13 β 4 q.

103. *Item*, If 3 lb cost 20 q, what cost 1 pound? *facit* 6 q 2 q and  $\frac{2}{3}$  of a Farthing.

104. *Item*, If 7 Yards cost 2 £ 15 β, what cost 1 Yard? *facit* 7 β 10 q 1  $\frac{1}{2}$  q.

105. *Item*, if 4 β buy 5 Yards, how many Yards will 12 £ 10 β buy? *facit* 312 Yards 2 quarters.

106. *Item*, If 8 β buy 10 lb, how many pounds will 6 £ 5 β buy? *facit* 156 lb 4 ounces.

107. *Item*, If 7 lb cost 9 β, how many pounds will 13 £ 17 β buy? *facit* 215 lb 7 ounces.

*Note.*

In the working of this Rule, much labor may often be spared, if the first number can be abbreviated (or shortned) with the second, or third number, that is to say, If the first number be shortned (or divided) by 2. 3. 4. 5, &c. The second or third number must likewise be divided by the same figures, and the *Quotient* of such *Division* will serve instead of the number so divided, as the following examples will shew.

Q 4

108. *Item*,

# The Rule of Three direct.

108. Item, If 24 Yards cost 27  $\beta$ , what cost  
64 Yards? *facit* 3  $\text{L}$  12  $\beta$ .

| Yards  | $\beta$ | Yards |              |
|--------|---------|-------|--------------|
| 24     | 27      | 64    | r            |
| 3) ——— | 3) ———  | 9     | 576   7   2  |
| 8      | 9       | —     | 88 ———       |
|        |         | 576   | 3:12 $\beta$ |

*Facit* 3  $\text{L}$  12  $\beta$

The first number 24, and the second 27, being both divided by 3, the two *Quotients* are 8 and 9, which will serve instead of 24 and 27, because the proportion is still the same.

In working the *Rule of Three* by abbreviation, abbreviate the numbers as much as you can; for the more you do it, the lesser your *Division* will be; yea, if you can abbreviate the *Divisor* (or the first number) to an unite or 1, no *Division* is required at all; for the *Product* of the *Multiplication* of the second and third number, is the *facit* desired, as you may see by the following operation.

| Yards  | $\beta$ | Yards |
|--------|---------|-------|
| 24     | 27      | 64    |
| 3) ——— | 3) ———  | 8)    |
| 8      | 9       | 8     |
| 8) ——— |         | 9     |
| 1      |         | —     |

72  $\beta$  or 3  $\text{L}$  12  $\beta$ .

*Note*, Further, that the three numbers being abbreviated as much as can be; if the second number



number onely be lessened to an unite or 1, then divide the third number by the first onely, without multiplying at all; but if the third number be lessened to 1, then divide the second by the first, as you may see by the following examples.

109. If 84 Yards cost 14  $\beta$ , what cost 62 Yards? *facit* 10  $\frac{1}{2}$   $\beta$  or 10  $\beta$  4  $\text{q}$ .

| Yards | $\beta$ | Yards |   |
|-------|---------|-------|---|
| 84    | — 14 —  | 62    |   |
| 7) —  | 7) —    | 2) —  | 3 $\frac{1}{2}$ (10 $\beta$ and $\frac{1}{2}$ $\beta$ |
| 12    | 2       | 31    | 3 $\frac{1}{2}$ or 4 $\text{q}$                       |
| 2) —  | 2) —    |       | <i>Facit</i> 10 $\beta$ 4 $\text{q}$                  |
| 6     | 1       |       |   |
| 2) —  |         |       |   |
| 3     |         |       |   |

110. *Item*, If 72 Ells cost 56  $\beta$ , what cost 12 Ells? *facit* 9  $\frac{1}{3}$   $\beta$  or 9  $\beta$  4  $\text{q}$ .

| Ells | $\beta$ | Ells |                             |
|------|---------|------|-----------------------------|
| 72   | — 56 —  | 12   |                             |
| 6) — | 2) —    | 6) — | (1                          |
| 12   | 28      | 2    | 28 (9 $\frac{1}{3}$ $\beta$ |
| 2) — |         | 2) — | 3                           |
| 6    |         | 1    | or 9 $\beta$ 4 $\text{q}$   |
| 2) — |         |      | <i>Facit.</i>               |
| 3    |         |      |                             |

*Note*, Having abbreviated the three numbers, as much as can be; if the first and second be lessened each to 1, then the third number is the *facit*; but if the first and third number be lessened each to 1, then the second number is the *facit*, as followeth.

111. *Item*,

## The Rule of Three direct.

111. Item, If 6 lb cost 2  $\beta$  6  $\text{q}$ , how many pounds will 13  $\beta$  9  $\text{q}$  buy? *facit* 33 lb.

|                    |    |                    |
|--------------------|----|--------------------|
| $\beta$ $\text{q}$ | lb | $\beta$ $\text{q}$ |
| 2—6                | 6  | 13—9               |
| 12                 | 6) | 12                 |
| —                  | 1  | —                  |
| 30                 |    | 35                 |
| 6)                 |    | 13                 |
| 8                  |    | —                  |
| 5)                 |    | 168                |
| 1                  | 5) | —                  |
|                    |    | 33 lb              |
|                    |    | <i>Facit.</i>      |

112. Item, How many pounds will 7  $\beta$  6  $\text{q}$  buy, if 37  $\beta$  6  $\text{q}$  buy 105 lb, *facit* 21 lb.

|                    |                     |                    |
|--------------------|---------------------|--------------------|
| $\beta$ $\text{q}$ | lb                  | $\beta$ $\text{q}$ |
| 37—6               | 105                 | 7—6                |
| 12                 | 5)                  | 12                 |
| —                  | 21 lb               | —                  |
| 80                 |                     | 90                 |
| 37                 |                     | 9)                 |
| —                  |                     | 1                  |
| 450                | <i>Facit</i> 21 lb. |                    |
| 9)                 |                     |                    |
| 8                  |                     |                    |
| 5)                 |                     |                    |
| 1                  |                     |                    |

113. Item, If 15 Yards cost 3  $\text{L}$  15  $\beta$ , how many Yards will 25  $\text{L}$  10  $\beta$  buy? *facit* 102 Yards.

114. Item,

114. *Item*, If 27  $\text{℥}$  cost 6  $\text{β}$  9  $\text{q}$ , what cost 873  $\text{℥}$ ? *facit* 10  $\text{L}$  18  $\text{β}$  3  $\text{q}$ .

115. *Item*, What will cost 4 pieces of Cloth long 35: 34: 41: and 42 Yards at 8  $\text{β}$  6  $\text{q}$  the Yard? *facit* 64  $\text{L}$  12  $\text{β}$ .

116. *Item*, What will cost 16 pieces of Bays, each long 52 Ells at 26  $\text{q}$  the Ell? *facit* 90  $\text{L}$  2  $\text{β}$  8  $\text{q}$ .

Reduce the Bays into Ells, and you shall finde 832 Ells; then say, if 1 Ell cost 26  $\text{q}$ , what 832 Ells, &c?

117. *Item*, What cost 44 pieces of Linnen Cloth, each long 53 Ells at 22  $\text{q}$  the Ell? *facit* 213  $\text{L}$  15  $\text{β}$  4  $\text{q}$ .

118. *Item*, Suppose that 8 times 12 were 98, how much is 12 times 16 according to that account? *facit* 196.

119. *Item*, How many pieces of money at 13  $\text{q}$  2  $\text{q}$  the piece, must be paid for 32 pieces of Holland, each long 36 Yards at 12  $\text{β}$  4  $\text{q}$  the Yard? *facit* 12629 pieces and 4  $\text{q}$  2  $\text{q}$ .

120. *Item*, A Shopkeeper bought 12 pieces of Cloth, each long 35 Yards, agreeing to pay 16  $\text{β}$  6  $\text{q}$  for every Ell; what must he pay for the whole parcel? *facit* 277  $\text{L}$  4  $\text{β}$ .

121. *Item*, If 12 pieces of Cloth, each long 35 Yards, cost 277  $\text{L}$  4  $\text{β}$ , what cost an Ell? *facit* 16  $\text{β}$  6  $\text{q}$ .

122. *Item*, A Marchant bought 6 Chests of Sugar, weighing together 11 C 2 quarters 16 pounds gross. *Tare* 1 C 3 quarters 19 pounds, for all the Chests, at 18  $\text{q}$  the pound neat, what amounts

amounts the whole ? *facit* 81 £ 13 β 6 q.

*Note*, *Tare* is the weight of that wherein any thing is put; as a Chest for Sugar, a Bag for Pepper, &c. Therefore subtract the *Tare* (which is 1 C 3 quarters 19 pounds) from the gross or whole weight (which is 11 C 2 quarters 16 pounds) the rest will be 9 C 2 q 25 <sup>oz</sup> neat; then say, if 1 pound neat, cost 18 q, what 9 C 2 q 25 <sup>oz</sup>, &c.

123. *Item*, A Grocer bought 14 Chests of Sugar, weighing each 2 C 3 quarters 5 pounds gross. *Tare* 2 quarters 2 pounds for every Chest at 16 q the pound neat; what must he pay in all? *facit* 238 £.

124. *Item*, How many pounds of Raisins at 6 q the pound, can I have for 123 Yards of Cloth at 13 β 4 q the Yard? *facit* 3280 <sup>oz</sup>.

See first the worth of the Cloth in q, then divide that sum by six, the price of 1 pound of Sugar.

125. *Item*, A Shopkeeper bought the following commodities; to wit, 6 pieces of Cloth, each long 30 Yards, at 8 β 4 q the Yard. 346 <sup>oz</sup> of Pepper at 2 β 6 q the pound, and 820 <sup>oz</sup> of Cloves at 3 β 9 q the pound. He giveth in payment 54 £ 10 β in money, and 340 Yards of Holland at 3 β 6 q the Yard, the question is, what he owes still? *facit* 158 £.

126. *Item*, A. bought two Bags of Pepper, weighing gross 2 C 1 quarter 27 pounds, and the other 1 C 3 quarters 26 pounds. *Tare* 7 <sup>oz</sup> for the two Bags, and 4 <sup>oz</sup> *Tret* for every 104 <sup>oz</sup> at

at 2  
parc

# The Rule of Three direct.

237

at 2  $\beta$  the pound neat ; what amounts the whole  
parcel ? *facit* 47  $\text{£}$  10  $\beta$ .

|      |   |     |    |
|------|---|-----|----|
|      | C | Qrs | lb |
| Adde | 2 | 1   | 27 |
|      | 1 | 3   | 26 |

|   |   |    |                   |
|---|---|----|-------------------|
| 4 | 1 | 25 | Gros.             |
| 0 | 0 | 7  | $\text{ss}$ Tart. |

|   |   |    |         |
|---|---|----|---------|
| 4 | 1 | 18 | Subtil. |
|---|---|----|---------|

4

17

28

154

34

494

$\text{ss}$

Tret

$\text{ss}$

204

4

494

4)

4)

26

1

23 494

494 (19  $\text{ss}$  Tret.

266

2 475  $\text{ss}$  neat, at 2  $\beta$  the  $\text{ss}$ .

2  $\beta$

950

*Facit* 47  $\text{£}$  10  $\beta$ .

127. Items.



*The Rule of Three direct.*

127. *Item*, A Shopkeeper would bestow 120  $\text{L}$  in four sorts of Spices, to wit, Cloves at 4  $\beta$  6  $\text{d}$  the pound, Ginger at 12  $\text{d}$ , Pepper at 2  $\beta$  6  $\text{d}$ , and Cinnamon at 4  $\beta$  the pound, desiring to have an equal quantity of each sort; the question is, how many pounds of each sort he must have? *facit* 200  $\text{lb}$ .

128. *Item*, A Baker bought 3 Seams (or Quarters) of Wheat at 4  $\beta$  2  $\text{d}$  the Bushel, and 2 Seams and 5 Bushels of Rye at 2  $\beta$  6  $\text{d}$  the Bushel; he mixt an equal quantity together of each sort; the question is, what 7 Bushels of that mixture cost him? *facit* 23  $\beta$  4  $\text{d}$ .

129. *Item*, A. bought 3600 Oranges, and a quantity of Lemmons; for the sum of 46  $\text{L}$  2  $\beta$  6  $\text{d}$ , he did agree to pay 18  $\text{d}$  for every score of Oranges; the question is, how many Lemmons he bought, if 60 Lemmons cost him as much as 200 Oranges? *facit* 2610 Lemmons.

130. *Item*, A Marchant bought 798  $\text{lb}$  of commoditie for 299  $\text{L}$  less, so much money, as 99  $\text{lb}$  cost him, at the same rate; the question is, how many pounds he can buy at the same price for 2905  $\text{L}$ ? *facit* 8715  $\text{lb}$ .

## *Questions of the Rule of Three direct.*

1 Quest. **W**Hat is the Rule of Three ?

*Ans.* The Rule of Three is a Rule, which consists of three numbers known, to finde a fourth unknown.

Quest. 2. Hath that Rule no other name ?

*Ans.* Yes ; it is called the *Golden Rule*, or the *Rule of Proportion*.

Quest. 3. Why is it called the *Golden Rule* ?

*Ans.* It is so called for its excellency ; for as Gold exceeds all other Mettals, so doth this Rule exceed the others.

Quest. 4. Why is it called the *Rule of Proportion* ?

*Ans.* Because the three numbers propounded, and the fourth (which answers the question) are *Proportionals*.

Quest. 5. Into how many parts is the Rule of Three divided ?

*Ans.* It is commonly divided into two general parts ; to wit, *Single* and *Compound*.

Quest. 6. What is the *Single Rule of Three* ?

*Ans.* The *Single Rule of Three* is, when three numbers are propounded to finde a fourth *Proportional* to them.

Quest. 7. What is the *Rule of Three Compound* ?

*Ans.*

## The Rule of Three direct.

*Ans.* The Rule of Three Compound (otherwise called *The double Rule of Three*) is, when more then three terms (or numbers) are propounded.

Quest. 8. *Is that all the parts of the Rule of Three?*

*Ans.* No; for the *Single* and *Compound Rule of Three*, are divided each into two parts.

Quest. 9. *What are those parts?*

*Ans.* The *Single* and *Double Rule of Three*, are either *Direct* or *Reverse*.

Quest. 10. *What do you mean by the Single Rule of Three direct; what doth it teach?*

*Ans.* It teacheth to finde a fourth number in a *Direct Proportion*, when three are propounded.

Quest. 11. *What do you understand by Proportion?*

*Ans.* *Proportion* hath divers denominations or names. Some call it *Reason* (or *Relation*, or the *Reference* that the numbers have to one another) and others say, that it is the *Similitude* of the *Reasons* of some *Quantities*, which are of the same kinde.

Quest. 12. *Explain your meaning, and give a plain example.*

*Ans.* My meaning will appear plainly by these four following *Quantities* or *Numbers*; to wit, 12, 4 : 6, 3. Now the *Reason* (or *Proportion*) that 12 hath to 4 is called *Tripple Reason*, because 12 is three times greater then 4; or if 12 be divided by 4, the *Quotient* is 3, which sheweth the

the reason that 12 hath to 4, and some call that *Proportion*.

Further 6 to 3, is called double reason (or *Proportion*) because 6 being divided by 3, the *Quotient* is 2, which is double.

Now observe that the Similitude of these two Reasons (before mentioned) is also called *Proportion*.

Quest. 13. *How do you call the two numbers (or quantities) propounded, to finde the Reason or Proportion between them?*

Ans. The first number is called *Antecedent*, and the second the *Consequent*.

Quest. 14. *What do you understand by Reason here?*

Ans. By Reason in this place, I understand the Reason (or *Proportion*) which is between two quantities, or numbers (as is mentioned already) and is found by dividing the *Antecedent* by the *Consequent*, and the *Quotient* is the Reason, or *Proportion* desired.

Quest. 15. *What Reason or Proportion is between 16 and 4?*

Ans. I divide 16 by 4, the *Quotient* is 4, which is a *Quadrupla*, or fourfold Reason.

Quest. 16. *When three numbers are propounded, how do you finde a fourth in a direct Proportion?*

Ans. By multiplying the second and third number together, and dividing the *Product* by the first, the *Quotient* is the fourth number proportional required.

Quest. 17. *Give an example to make that plain?*

R

Ans.

## The Rule of Three direct.

*Ans.* Suppose that these three numbers 6, 3, 18, were given to finde a fourth in a direct Proportion: I multiply 18 by 3, the Product is 54, and dividing 54 by 6, the Quotient is 9, which 9 is the number sought.

Quest. 18. How do you know when four numbers are in a Direct, or reverse Proportion?

*Ans.* Four numbers are said to be in a Direct Proportion, when the first is to the third, as the second is to the fourth; or thus, as the first is to the second, so is the third to the fourth.

Quest. 19. Give an example?

*Ans.* Take the forementioned numbers, which are 6, 3, 18, and 9. Now observe that a 6 (the first number) is to 18 (the third) so is 3 (the second) to 9 (the fourth.)

Quest. 20. How do you know when four numbers are in a Proportion reverse?

*Ans.* It is to be known by this, when, as the first is to the third, so is the fourth to the second.

Quest. 21. Give an example?

*Ans.* These four numbers 3, 6, 9, and 2, are in a Proportion reverse; for as 3 is to 9, so is 2 to 6.

Quest. 22. Have you no other way to know when four numbers are in a direct Proportion, but by what hath been answered in the 17th. question?

*Ans.* Yes, that may be known another way, which is to multiply the two middle numbers together, and likewise the first and the fourth; and if their Product be equal, that shews that such numbers



numbers are in a direct Proportion.

Quest. 23. Give an example of that?

Ans. I shall take the four numbers mentioned in the 17th. answer, which are 6: 3: 18, and 9. Now if I multiply the two middle numbers (3 and 18) together, the *Product* will be 54, and multiplying also the first and the last number (6 and 9) the *Product* will be also 54, which shews that those four numbers are in a direct Proportion, as followeth.

$$\begin{array}{ccccccc} 6 & \text{---} & 3 & \text{---} & 18 & \text{---} & 9 \\ & & & & 3 & & 6 \\ & & & & \text{---} & & \text{---} \end{array}$$

54 equal to 54

Quest. 24. Have you another way to know when four numbers are in a Proportion reverse, then what is mentioned in the answer of the 20th Question?

Ans. Yes, that may be known by multiplying the first and second together, and also the third and fourth, and if the two *Products* be equal, that shews that those numbers are in a Proportion reverse.

Quest. 25. Give an example.

Ans. I shall take the numbers mentioned in the Answer of the 21 Question, which are 3: 6: 9, and 2. Now multiplying 3 by 6, and 9 by 2, the two *Products* are equal as followeth.

$$\begin{array}{ccccccc} 3 & \text{---} & 6 & \text{---} & 9 & \text{---} & 2 \\ 6 & & & & 2 & & \\ \text{---} & & & & \text{---} & & \end{array}$$

18 equal to 18

R 2

Quest.

*The Rule of Three direct.*

Quest. 26. *What do you observe in the Rule of Three direct?*

Ans. The chiefeft thing to be observed in *The Rule of Three*, is to place the three numbers propounded in their right places.

Quest. 27. *Is that such a hard thing to do?*

Ans. It is hard for yong beginners, for oftentimes they mistake in that, when the three numbers are confusedly propounded.

Quest. 28. *Have you a certain rule to know how to place the three numbers in their right places?*

Ans. Yes, without great trouble.

Quest. 29. *What is your first observation in placing the three numbers?*

Ans. When a Question is propounded, the first thing to minde, is to observe what denomination the number required doth bear, either Money, Weight, Length, &c.

Quest. 30. *What then?*

Ans. That being known you must further understand, that one of the three numbers propounded, bears the same name (general or particular) with the number required, which number must always be set down in the second place.

Quest. 31. *What do you mean by general and particular names?*

Ans. By a general name I mean, Money, Weight, Length, &c. without naming what particular piece of Money, or what particular Weight or measure; and by a particular name, I mean what a particular thing is named, as *℥. β. 9. q. 11. lb. Ounces, Drams, or else Yards, Ells, &c.*

Quest.

*Quest. 22. When you know the number which must possess the second place, how do you know how to place the two other?*

*Answ.* The two other numbers may be placed without great difficulty, when the middle number is placed.

*Quest. 33. What is your observation in placing them?*

*Answ.* I observe to set in the first place one of these two numbers, which is equal in value with the second, though it be not of the same denomination.

*Quest. 34. How do you know the last or third number?*

*Answ.* When two numbers are placed, the third is soon found out, because there remains one number to be placed, which is the third.

*Quest. 35. Doth the first and third number differ in denomination?*

*Answ.* No, the first number and the third are always of the same name, general or particular.

*Quest. 36. If it be so, how do you know justly what number must possess the third, or first place?*

*Answ.* There is a Rule for the placing of every number; how to place the two first, I have already mentioned, for the last, or third number, it is known to be the third, because his worth or value is unknown.

*Quest. 37. Though you have already mentioned how to place the three numbers, yet I desire you would repeat it over again as short as you can, for to help my weak memory?*

R 3

*Answ.*

## The Rule of Three direct.

*Ans<sup>r</sup>.* I will do it: Observe then that the number which must be set in the second place, is always of the same denomination or name with the number required; and the first number is always equal in value, or worth with the second. Lastly, The third number is that upon which the question is stated (which is the number whose worth is unknown) must be in the last or third place.

*Quest. 38. The three numbers being thus placed, is there nothing more to observe before Multiplying and Dividing, according to the general rule mentioned in the answer of the sixteenth question, which is to multiply the second and third number together and divide the Product by the first?*

*Ans<sup>r</sup>.* Yes: You must further observe, whether the three numbers be single or compound.

*Quest. 39. What if they be single?*

*Ans<sup>r</sup>.* Then you may proceed according to the general rule before mentioned, to finde the fourth number unknown, the first and third number being of the same particular denomination.

*Quest. 40. But if they be compound.*

*Ans<sup>r</sup>.* They must be reduced into the least denomination mentioned in any of the numbers.

*Quest. 41. To make this necessary observation the more plain, I shall ask some questions, whether the numbers will be of different denominations.*

*Ans<sup>r</sup>.* This is a good way, and it will afford a double benefit.

*Quest. 42. How so?*

*Ans<sup>r</sup>.* Because in propounding some questions

ons, you may (besides your intended purpose concerning the different denominations of the numbers) observe and put in your minde the rule before mentioned, touching the placing of the numbers.

*Quest. 43. You say true: Now I think it the best way to begin with that.*

*Ans. I think so too.*

*Quest. 44. If five Yards cost 3 £, what cost 25 Yards? How are these three numbers to be set in their right order?*

*Ans. They are propounded regularly, that is, the three numbers are named in the question as they ought to be placed in their order.*

*Quest. 45. How many ways may a question be propounded, besides the regular way?*

*Ans. There are variety of ways, I shall mention three onely, which will be the same question before mentioned, as followeth.*

1. If 3 £ buy 5 Yards, what cost 25 Yards?

2. What cost 25 Yards, if 5 Yards cost 3 £?

3. What cost 25 Yards, if 3 £ buy 5 Yards?

*Quest. 46. Must the three numbers of these three questions, be set down in the like order one to another?*

*Ans. Yes; because it is the same question propounded three sundry ways; the ordering of the three numbers, is as followeth.*

|       |       |       |          |
|-------|-------|-------|----------|
| Yards | £     | Yards | £        |
| 5     | — 3 — | 25    | Facit 15 |
|       | R 4   |       | Quest.   |



*The Rule of Three direct.*

Quest. 47. *If the question had been thus: what quantity of Yards can I have for 15 £, if 5 Yards cost 3 £? how must the numbers be ordered?*

Ans. The question asks Yards, therefore, Yards must be in the second place, the 3 £ first, and 15 £ in the third place, thus,

$$\begin{array}{ccccc} \text{£} & & \text{Yards} & & \text{£} \\ 3 & \text{---} & 5 & \text{---} & 15 \end{array}$$

Quest. 48. *Suppose that the first number had been 3 β, (instead of 3 £) and the last as it is, to wit, 15 £?*

Ans. Then the 15 £ must have been reduced into Shillings, because the first is Shillings.

Quest. 49. *Must the first and third number be always of one particular denomination before you multiply and divide?*

Ans. Yes: If the first (or the last) be β, q, or q, and the other £ onely; then the £ (on the first or third place) must be reduced into such small denominations, as the other number is.

Quest. 50. *But if one of the numbers, to wit, the first or the third, be a compound number consisting of £, β, q, and q, and the other onely £, thus?*

$$\begin{array}{ccccccc} \text{£} & \text{Yards} & \text{£} & \beta & q & q \\ 3 & \text{---} & 6 & \text{---} & 19 & \text{---} & 16 & \text{---} & 8 & \text{---} & 2 \end{array}$$

Ans. If the third number be compound, and the

the first single; or, if they be both compound, I must do the same thing, which is to reduce both the numbers into the least denomination mentioned in either of them.

*Quest. 51. Give an example of that.*

*Answ.* If the three numbers are as followeth.

$\mathcal{L} \quad \beta \quad \mathcal{G} \quad \text{Yards} \quad \mathcal{L} \quad \beta \quad \mathcal{G} \quad \mathcal{q}$   
 $3 - 10 - 6 - 5 - 19 - 6 - 8 - 2$

Then both the first and third number must be reduced into Farthings. because one of them (to wit, the third) hath Farthings for its least denomination. If one of the said numbers had consisted of  $\mathcal{L}$  onely, or of  $\mathcal{L}$  and  $\beta$ , or  $\mathcal{L}$ ,  $\beta$ , and  $\mathcal{G}$ , or  $\mathcal{L}$ ,  $\beta$ ,  $\mathcal{G}$ , and  $\mathcal{q}$ , that had been alone working; for both the said numbers must have been reduced into  $\mathcal{q}$ .

*Quest. 52. I perceive, that when one of these two numbers (the first and the third) hath a small denomination annexed unto it, that both the numbers must be reduced into such small denominations; whether both the numbers or one, be compound?*

*Answ.* Yes; this is well observed, the same observation must be remembred, when several denominations of weight (or measure) are in the first and last place, as followeth.

$\text{lb} \quad \text{Ounc.} \quad \text{Dra.} \quad \mathcal{L} \quad \text{lb} \quad \text{Ounc.} \quad \text{Dra.} \quad \text{Scru.}$   
 $13 - 13 - 3 - 2 - 16 - 9 - 4 - 1$

*Quest. 53. Must both these compound numbers be reduced into Scruples, because one of them hath Scruple annexed to it?*

*Answ.*

*The Rule of Three direct.*

*Ans.* Yes ; and if any grains had been mentioned in any of these two numbers , they must have been reduced into grains.

*Quest.* 54. *I am now satisfied concerning the first and third number, let us go to the second.*

*Ans.* Observe what followeth for a general rule. Having reduced the first and third number into one denomination (if they differ) as is said before, then observe whether the second number be single or compound ; if it be single, multiply it with the third, and divide the *Product* by the first, the *Quotient* is ever of the same denomination, as the second number is.

*Quest.* 55. *I perceive then, that if the middle (or second) number be  $L$ , the fourth number (or the Quotient of the Division) is  $L$  also ; is that your meaning ?*

*Ans.* Yes ; and if the said second number be  $\beta$ , the fourth is  $\beta$  ; if  $\vartheta$  the fourth, is  $\vartheta$ , &c.

Further, if the said middle number be  $tb$ , the fourth is  $tb$  ; if ounces or drams, the fourth is ounces or drams, &c.

*Quest.* 56. *But if the said second number be compound, what then ?*

*Ans.* If the second number be compound, then the greater denominations of the said number must be reduced into the least denomination mentioned.

*Quest.* 57. *Give an example.*

*Ans.* If the said number consist of  $L, \beta$ , then it must be reduced into  $\beta$ . If any  $\vartheta$  be found

found in that number, then it must be reduced into  $\text{q}$ . Lastly, if such a compound number hath any  $\text{q}$  annexed to it, then it must be reduced into  $\text{q}$ .

Quest. 58. *If the middle number did consist of Pounds, Ounces, and Drams, what must you do?*

Ans. I must then reduce such a compound number into Drams.

Quest. 59. *Why not into Scruples or Grains?*

Ans. Because the least denomination in that number supposed, is but Drams: If any Scruples or Grains had been mentioned, then I should reduce such a number into that small denomination you speak of.

Quest. 60. *If 35  $\text{ß}$  be paid for 3 Ells, what will cost 96 Ells? how shall I answer this question?*

Ans. This question hath no difficulty in it, follow but the general rule.

Quest. 61. *In following the rule, I finde the fourth number to be 1120  $\text{ß}$ , must they be reduced into Pounds?*

Ans. Yes; for it is improper to say to any one, you must pay or receive 1120  $\text{ß}$ , but it is more proper to say 56  $\text{£}$ , which is as much as 1120  $\text{ß}$ .

Quest. 62. *Now I perceive, that when the fourth number is found out, if it be  $\text{ß}$ ,  $\text{q}$ , or  $\text{q}$ , then I must reduce them always into as great denomination, as the number wil. permit.*

Ans. Your observation is good, for sometimes the fourth number may be reduced into  $\text{£}$ ,  
and

*The Rule of Three direct.*

and sometimes it cannot, by reason of the small quantity of the lesser denominations.

*Quest. 63. But, must always the fourth number be reduced into Pounds, when it can be reduced so?*

*Ans.* Yes; if the question requires generally a sum of money, without naming any other particular name.

*Quest. 64. Explain your meaning.*

*Ans.* My meaning is, if the question did require a certain number of pieces of money, as Crowns, Nobles, Marks, &c. then the fourth number must not be reduced into Pounds, but into such pieces of money as the question requires.

*Quest. 65. I understand now what you mean, yet I shall propound a question for my further satisfaction, which is this. If 10 Yards of Cloth cost 7 £ 13 s 4 d, how many Nobles is to be paid for 40 Yards? how shall this question be answered?*

*Ans.* Follow the general rule before mentioned, then you shall finde 7360 d for the fourth number *Proportional*, then divide this quantity of pence, by the worth of a Noble, which is 80 d, and the *Quotient* shall be 92 Nobles for the answer of the question.

*Quest. 66. I am now satisfied also concerning the second number of the Rule of Three, for I understand by what hath been said, that the fourth number being found out, it may be reduced afterward into what denomination soever that the question doth require.*

*Ans.*



*Answ.* You have it right; now observe also the same thing, when you finde that the fourth number consists of a quantity of small weights (or measures) as Ounces, Drams, &c. you may reduce them into lb's, or into Quarters of a Hundred, according as the question requires.

*Quest. 67. I have something more to ask, which is this, whether I must always (in this Rule) multiply the two last numbers together, and divide the Product by the first?*

*Answ.* You may if you will, but it is sometimes needless, according as the numbers are.

*Quest. 68. How shall I know when it is needless, or necessary?*

*Answ.* That may be known two manner of ways.

*Quest. 69. What is the first way?*

*Answ.* When you see that the first number is but an unite, or 1, then it is needless to divide by 1, because the *Quotient* will be as much as the *Dividend*.

*Quest. 70. What; is then the Product of the Multiplication of the second and third number, the fourth required?*

*Answ.* Yes, and such *Product* bears the same name, as you left your second number in.

*Quest. 71. But if any one of the two other numbers be but an unite or 1, what then?*

*Answ.* If the second or last number be but 1, then you need not to multiply but divide onely that number (which is more then 1) by the first, and the *Quotient* will answer the Question; for  
in

in multiplying by 1, the *Multiplicand* will not be encreased at all, and therefore it is needless to multiply by 1.

*Quest. 72. Now I perceive that an unite (or 1) neither multiplies nor divides, but yet I have still some doubts unresolved.*

*Ans.* Propound them all, and I shall resolve or answer them if I can.

*Quest. 73. If it happen that the second and third numbers be but each of them an unite (or 1) what must I do in this case?*

*Ans.* If the two last numbers be each of them but 1, then you may conclude that the fourth number required, cannot be an unite (If the first number be more then 1) but a Fraction (or a broken number) which will be a part, bearing the name of the second number (if 1 may be called a number)

*Quest. 74. Give a plain example, for this seem very difficult to understand?*

*Ans.* Suppose this Question be propounded; If 4 Yards, cost 1 £, what cost 1 Yard?

In this Question you see that the number to be divided (or the Dividend) is but 1, and the Divisor is 4; now the Quotient of such Division will be but  $\frac{1}{4}$  or a fourth part of 1 £, which is a Fraction of a pound.

*Quest. 75. I perceive that a fourth part of a pound is 5 s, but is there no other ways to find these 5 s, without making a Fraction of a pound?*

*Ans.* Yes, as followeth, When you find that the Dividend (or the Product arising from the Multiplication

*Multiplication* of the second, and third number )  
 be less then the *Divisor* (or first number) reduce  
 the second number (if you can) into a lesser deno-  
 mination ( or into the smallest denomination you  
 can, if you will) then divide such *Product* by the  
 first number.

Quest. 76. Give an example ?

Ans. If 8 Yards cost 2 £, what cost 2  
 Yards.

|       |       |       |
|-------|-------|-------|
| Yards | £     | Yards |
| 8     | — 2 — | 2     |

By this Question you may see that in multiply-  
 ing the second and third number together, the  
*Product* is but 4, and the first number ( which is  
 the *Divisor*) is 8 ; therefore I reduce the 2 £ (or  
 the second number) into shillings , the *Product*  
 is 40, which being multiplied by the third num-  
 ber 2, the last *Product* is 80, for the Dividend,  
 and dividing 80 by 8, the *Product* is 10 £ for the  
*Facit* as followeth.

|       |       |       |                 |
|-------|-------|-------|-----------------|
| Yards | £     | Yards |                 |
| 8     | — 2 — | 2     |                 |
|       | 20    |       | 80 (10 £        |
|       | —     |       | 88 <i>Facit</i> |
|       | 40 £  |       |                 |
|       | 2     |       |                 |
|       | —     |       |                 |
|       | 80    |       |                 |

Quest. 77. why did you not reduce the 2 £  
 into 9, but 10 £ only.

Ans.

## The Rule of Three direct.

*Ans.* Because I did perceive that in reducing the 2 £ into shillings onely, and the *Product* being multiplied with the third number, that the *Multiplication* would give a *Product* great enough to divide by the first number.

*Quest.* 78. But if you had reduced the said second number into 9, the facit had been the same sum as before, to wit, 10 8, had it not?

*Ans.* It is true, but it had been more trouble, for the fourth number had been but 9, then another *Division* had been required to reduce the 9 into Shillings.

*Quest.* 79. When is it needful to reduce the second number (being sing'e) into its smallest denomination?

*Ans.* The second number is to be reduced into its smallest denomination (though it be single) when the first number is greater then the *Product*, arising from the two last numbers multiplied together, as appears by the following question.

If 1440 lb cost 3 £, what cost 1 lb.

|      |   |    |
|------|---|----|
| lb   | £ | lb |
| 1440 | 3 | 1  |

I must reduce the 3 £ into such a small denomination, until I can get a *Product* (or *Dividend*) great enough to divide by 1440; therefore I reduce the 3 £ into q, as followeth.

lb 1440

|       |      |    |
|-------|------|----|
| ℥     | ℒ    | ℥  |
| 1440  | 3    | 1  |
|       | 20   |    |
| <hr/> |      |    |
|       | 60   | β  |
|       | 12   |    |
| <hr/> |      |    |
|       | 120  |    |
|       | 60   |    |
| <hr/> |      |    |
|       | 720  | q  |
|       | 4    |    |
| <hr/> |      |    |
|       | 2880 | q. |

2880 (2 q  
 1440 Facit

In reducing the 3 ℒ into q, the *Product* is but 720 q; therefore I reduce them into q, the last *Product* is 2880 q; which being divided by 1440, the *Quotient* is 2 q, for the answer of the question.

*Quest. 80.* Suppose that the *Product* (arising from the two last numbers, multiplied together) be great enough to be divided by the first number. If there be any Rest in the Division, what do you do with it?

*Ans.* The number which remains in the Division is a Fraction, or a part of an Unite of like name with the Second number, as hath been said already.

*Quest. 81.* Give an example for a further satisfaction.

S

Ans.



# The Rule of Three direct.

*Answ.* If 3 Yards cost 7 £, what cost 4 Yards.

| Yards | £  | Yards |                      |
|-------|----|-------|----------------------|
| 3     | 7  | 4     | (1                   |
|       | 4  |       | 28 (9 <sup>1</sup> £ |
|       | —  |       | 3 Facit              |
|       | 28 |       |                      |

I multiply the two last numbers together, the *Product* is 28, which being divided by 3, the *Quotient* is 9, and there remains 1; which is a third part of 1 £.

*Quest. 82.* Should there be any Remainder in the said Division, if you had reduced the 7 £ into a lesser denomination?

*Answ.* It is so sometimes, that in reducing the second number (being £) into β, q, or q, that there remains nothing in the Division; but some other times (according as the numbers are) there will remain something, though you reduce the said second number to never so small denomination. I shall try whether there will rest any thing in the Division in reducing the 7 £ into β, as followeth.

| Yards | £     | Yards |                          |
|-------|-------|-------|--------------------------|
| 3     | 7     | 4     |                          |
|       | 20    |       | 22(2                     |
|       | —     |       | 560 (186 β               |
|       | 140 β |       | 333 9 £ 6 <sup>1</sup> β |
|       | 4     |       |                          |
|       | —     |       |                          |
|       | 560   |       |                          |

In reducing the second number into  $\beta$ , and working according to the Rule, I finde 186  $\beta$  or 9  $\mathcal{L}$  6  $\beta$ , but there remains 2 in the Division, which are  $\frac{2}{3}$   $\beta$ , or two thirds of a  $\beta$ .

Quest. 83. I perceive by your words and working, that when any thing remains in a Division, that the Remainder is called a part of an Unit, which is of the same name as the Quotient (or second number) is, am I not right?

Ans. You speak true; for it is evident, that before the reducing of the 7  $\mathcal{L}$  into  $\beta$ , the facit was 9  $\mathcal{L}$  and  $\frac{1}{3}$   $\mathcal{L}$ , or a third part of 1  $\mathcal{L}$ ; but having reduced the said 7  $\mathcal{L}$  into  $\beta$ , the facit (or fourth number) was 186  $\beta$  or 9  $\mathcal{L}$  6  $\beta$ , and two thirds of 1  $\beta$ .

Quest. 84. But if I had reduced the said 7  $\mathcal{L}$  into  $\mathcal{S}$  should there be any Rest (or Remainder) still in the Division?

Ans. I shall make a trial of it as followeth.

Yards       $\mathcal{L}$       Yards

3 ——— 7 ——— 4

20

140  $\beta$

12

280

140

1680  $\mathcal{S}$

4

6720

1

6720 (2240  $\mathcal{S}$

3333

108(8

2240 (18) 6  $\beta$

1222

11

9  $\mathcal{L}$  6  $\beta$  8  $\mathcal{S}$

S 2

Having

*The Rule of Three direct.*

Having reduced the 7  $\mathcal{L}$  into 9, and working according to the Rule, I finde 2240 9 for the fourth number without any Rest, which 9 being reduced into  $\mathcal{L}$ , the *facit* is 9  $\mathcal{L}$  6  $\beta$  8 9, as you see above.

Quest. 85. Have you no other way to finde the said *facit*, then by reducing the 7  $\mathcal{L}$  into 9?

Ans. Yes; but it is no less troublesome than that way already mentioned.

Quest. 86. Work the same question that was that I may see the difference.

Ans. I shall do it as followeth.

|       |               |       |                                  |
|-------|---------------|-------|----------------------------------|
| Yards | $\mathcal{L}$ | Yards |                                  |
| 3     | — 7 —         | 4     | (1                               |
|       | 4             |       | 28 (9 $\mathcal{L}$ Rest 1 third |
|       | —             |       | 3                                |
|       | 28            |       |                                  |

Having multiplied and divided, I finde 9 and 1 remaining. Now to know how many the Rest is, I must multiply it by 20 (because it is a Fraction of 1  $\mathcal{L}$ , to wit,  $\frac{1}{3}$ , or a third part, and divide the *Product* by the same *Divisor* as before, as followeth.

1 Rest or Remainder.

|            |  |
|------------|--|
| 20         | (2                                       |
| —          | 20 (6 $\beta$ Rest 2 thirds of 1 $\beta$ |
| 20 $\beta$ | 3  |

Having multiplied the Remainder by 20, and divided by 3, I finde 6  $\beta$ , but there remain

still 2, which is two thirds of 1  $\beta$  ; therefore I must multiply 2 by 12, and divide the *Product* by the same *Divisor* 3, to know how many  $\mathcal{G}$  such Rest doth amount unto, as followeth.

The Remainder is 2

$$\begin{array}{r} 12 \quad 24(8\mathcal{G}) \\ \hline 3 \\ 24 \end{array}$$

Having multiplied the second Rest (which is two thirds of 1  $\beta$ ) by 12, and divided by 3, the *Quotient* is 8  $\mathcal{G}$  ; so that the whole *facit* is 9  $\mathcal{L}$  6  $\beta$  8  $\mathcal{G}$ , as before.

*Quest. 87. Suppose that in working one way or other, you did finde always a Remainder, though you should reduce the second number into Farthings ; what do you with such a small Rest ?*

*Ans.* Having found, as nigh as I could, the worth of the third number (by one of the two ways before mentioned) to a Farthing, then I should neglect the Rest as being not worth a whole Farthing, because a Farthing is the least piece of money that is in use, and a part of it is seldom quarrelled for, between the Buyer and the Seller.

*Quest. 88. Give an example.*

S 3

*Ans.*

## The Rule of Three direct.

Ans<sup>r</sup>. If 3 lb cost 20 s, what cost 2 lb?

|    |        |    |                  |
|----|--------|----|------------------|
| lb | s      | lb |                  |
| 3  | — 20 — | 2  | x(1              |
|    | 2      |    | 40 (13 s Rest 1. |
|    | —      |    | 33               |
|    | 40     |    |                  |

Having multiplied and divided according to the Rule, I finde 13 s, but there Rest 1, which I multiply (*per forme*) by 4: The *Product* is 4 still, which 4 being divided by 3, the *Quotient* is 1 q, and there remains 1 still, which is a third part of 1 q, thus.

|               |                                  |
|---------------|----------------------------------|
| The Rest is 1 | (1                               |
| 4             | 4 (1 q and $\frac{1}{3}$ of 1 q. |
| —             | 3                                |
| 4             |                                  |

The whole *facit* is 13 s 1 q, and a third part of 1 q: Which Rest is too little to require the payment of it.

Quest. 89. I understand your manner of working, which (as I conceive) is thus: When you finde any Rest, you work any one of the two ways before mentioned, to finde the answer of the question as nigh as to a Farthing; and if there be still a Rest, you omit it, as being too little to be regarded. Is this your way and meaning?

Ans<sup>r</sup>. Yes; you have it right.

Quest. 90. But I remember what you told me the answers of the 67 and 68 questions; which is that it was sometimes needless to multiply them



last numbers together, and that such thing might be known two manner of ways.

*Answ.* I remember it, and I have mentioned one way already; which is, when the second or third number be but an Unite or 1. then it is needless to multiply.

*Quest. 91. Declare the other way in few words, how Multiplication may be avoided?*

*Answ.* Before I speak of that, you may take notice that you may sometimes avoid dividing by the first number, as well as multiplying.

*Quest. 92. Is it possible? But is that a general way?*

*Answ.* No; for sometimes you must of necessity follow the common and general way before mentioned.

*Quest. 93. Which way do you go to work, and how do you call such manner of working?*

*Answ.* I abbreviate the numbers one against another, and therefore that way is called the working by *Abbreviation*.

*Quest. 94. What do you mean by Abbreviation?*

*Answ.* By Abbreviation, I mean, when two numbers are shortned one against another.

*Quest. 95. Is that way useful to be known, seeing it is not general?*

*Answ.* Yes; very useful, for (though it be no general way) many a time; much labor is spared that way, which otherwise doth prove very tedious.

# The Rule of Three direct.

Quest. 96. *May that way be often practised?*

Ans. Yes ; sometimes more, sometimes less.

Quest. 97. *Declare it with brevity.*

Ans. The three numbers being set down in their right places, I observe, whether the first number can be abbreviated (or shortned) against the second or third ; that is, whether it be possible to divide the first number, and one of the two others, by one of the same number (or figure) as 2. 3. 4. 5 6, &c. without any rest.

Quest. 98. *What then ?*

Ans. If that be possible, then the *Quotients* of such *Divisions* will serve instead of the numbers so divided, and so the work will be the shorter.

Quest. 99. *Give an example*

Ans. If 8 Yards cost 16 £, what cost 32 Yards ?

|        |        |            |
|--------|--------|------------|
| Yards  | £      | Yards.     |
| 8 ———  | 16 ——— | 32         |
| 8) ——— | 8) ——— | 2          |
| 1      | 2      | ————       |
|        |        | Facit 64 £ |

I perceive that the first number 8, and the second 16, may be divided by 8 without any Rest; therefore dividing these two numbers by 8, the two *Quotients* are 1 and 2, as you see above. Now 1 does serve in stead of 8, and 2 in stead of 16 ; and in multiplying the last number 32 by 2, the

the Product is 64 £ for the facit without any further trouble.

*Quest. 101. I see that it is a very short way; but what is the reason of this manner of working, why it comes so to pass, that the right facit is produced in working by abbreviation?*

*Ans.* The foundation and chief reason, why the true answer is produced in working by Abbreviation, is, because the numbers keep still their Proportion or Reason, one towards another, though they be abbreviated or shorted.

*Q. st. 101. Explain your meaning.*

*Ans.* In saying thus, If 8 Yards cost 16 £, or if 1 Yard cost 2 £, is the same thing; the reason between 8 and 16, or 1 and 2, is the same (which Reason or Proportion is called *Subdupla*) for 16 contains 8 twice, and so doth 2, contain 1 twice.

*Quest. 102. I understand you: But may you abbreviate the first number and the third, one against another?*

*Ans.* Yes; that may be done, if the numbers will permit it; that is, if both the numbers can be divided by the same figure (or number) without any Rest.

*Quest. 103. I perceive that you may shorten the first and third number of the question before mentioned, because the third and the first number may be divided, either by 2. 4. or 8. without Rest.*

*Ans.* This is well observed, I shall work the said question over again that way, to shew that  
you

*The Rule of Three direct.*

you may shorten the first number against one of the two other, which you see most convenient.

$$\begin{array}{rcccl}
 \text{Yards} & & \text{£} & & \text{Yards} \\
 8 & \text{---} & 16 & \text{---} & 32 \\
 8) \text{---} & & 4 & 8) \text{---} & \\
 1 & & & & 4 \\
 \text{Facit } 64 \text{ £} & & & & 
 \end{array}$$

In shortning (or dividing) the first and the third number by 8, the two *Quotients* are 1 and 4. Now I multiply the second number 16 by 4, the *Product* is 64 for the *Facit*, without further trouble.

*Quest. 104. I see that this way, and the other, are much alike.*

*Ans.* There is no great difference; you may take notice by the way, that you may chuse the second or third to be abbreviated against the first, or the first against the two other.

*Quest. 105. I know that to be true; and I perceive further, that the reason why I do not divide by the first number, as in the common way, is, because the said number is shortned to an Unite, or 1.*

*Ans.* You have hit it right: You may observe also, that when you can shorten one of the two last numbers so far, as to bring one of them to an Unite, or 1, that will spare you the labor of a *Multiplication*.

*Quest. 106. Give an example where such thing may be done.*

*Ans.*

# The Rule of Three direct.

267

*Ans.* If 16 £ buy 8 Yards, what quantity of Yards will 64 £ buy?

$$\begin{array}{rcl}
 \text{£} & \text{Yards} & \text{£} \\
 16 & \text{---} 8 & \text{---} 64 \\
 8) \text{---} & 8) \text{---} & 64 \text{ (32 Yards.} \\
 2 & 1 & 22 \text{ Facit.}
 \end{array}$$

In abbreviating the first and second number by 8, the two *Quotients* are 2 and 1. Now I do not multiply the second and third together, because the second is but 1; therefore I divide onely 64 by 2, the *Quotient* is 32 Yards for the *Facit*.

*Quest.* 107. I see plainly, that when any of the two last numbers be shortned to an Unite, that there is no need of *Multiplication*; but if both the first, and one of the two other, were abbreviated so short; what then?

*Ans.* Then the work would be yet shorter.

*Quest.* 108. Give an example for my satisfaction.

*Ans.* The last example mentioned will suffice, as followeth.

$$\begin{array}{rcl}
 \text{£} & \text{Yards} & \text{£} \\
 16 & \text{---} 8 & \text{---} 64 \\
 8) \text{---} & 8) \text{---} 2) \text{---} & \\
 2 & 1 & 32 \text{ Yards.} \\
 2) \text{---} & & \text{Facit.} \\
 1 & &
 \end{array}$$

Having abbreviated the first and second one against another, the two *Quotients* are 2 and 1. Now I abbreviate further, the first and the third number,



*The Rule of Three direct.*

to wit, 2 and 64, and the two *Quotients*, are 1 and 32. And seeing, that the two first numbers are abbreviated each to an Unite, or 1, then the last number 32 is the *Facit*, and must bear the same name as the middle number doth, which is Yards.

*Quest. 109. I perceive that you may abbreviate the numbers more then once.*

*Ans.* Yes; sometimes two, three, or four times according as the numbers are.

*Quest. 110. When the numbers are compound, may they be shortned so too?*

*Ans.* Sometimes they may, but the most general way is to reduce the numbers into their lesser denomination, and then to abbreviate them as is said before.

*Quest. 111. May the second number be abbreviated against the third?*

*Ans.* No; but the first may be abbreviated against either of them both, as many times as the numbers will permit.

*Quest. 112. Have you a general rule to know what are those numbers that are to be abbreviated one against another?*

*Ans.* Yes; the general rule is to abbreviate those numbers one against another, which doth not multiply each other; and this way is very useful in working the Rule of Five Numbers (called the *Double Rule of Three*) and also the *Conjunctive Rule*, where there may be so many numbers inserted as you please; sometimes 10. 20. 30. or more numbers, as you may see in the second Part of this Book.

*Quest.*

*Quest. 113. I see, that working by Abbreviation, is of great use in those Rules you have mentioned: But when no number can be abbreviated one against another, what is to be done?*

*Answ.* In such a case, you must of necessity follow the other way before mentioned, which is to multiply the second and third number together, and divide the Product by the first.

*Quest. 114. I am fully satisfied concerning that useful Rule of Three. What is the next to be spoken unto?*

*Answ.* The next thing to be handled, is the *Fractions*, which are explained in the Second Part.

John Smith is my name

John Smith is my name

John Smith is my name 1678

John Smith is my name

John Smith is my name

John Smith is my name 1678

John Smith is my name 1678

1678

A N

# Appendix.

To the READER.



Y Intentions were to have proceeded no further, then the *Rule of Three*, in whole Numbers in this

First Part, fearing it would swell up too much: I have nevertheless added unto it, some short beginnings of *Fractions*, and some *Questions* and *Examples* of the *Rule of Practice*, tending to the encouragement of those that delight in this profitable *Art*.

Con-

Concerning *Fractions* and their use, they are explained at large in the Second Part; which (if God spare life) will come forth in convenient time, if this first finde some acceptance.

J. L. D.

---



## APPENDIX.

**B**efore the Learner venture upon the Rule of Practice, it is very needful to understand what Fractions are, and their value, as followeth.

*What a Fraction is.*

A Fraction is a broken number, or a part of a whole, of what denomination soever it be (as Pounds, Shillings, Pence, Farthings, Yards, ff, Ounces, &c.) and is expressed or written with two numbers, with a little line between them, as followeth.

|                |                |                   |
|----------------|----------------|-------------------|
| $\frac{1}{2}$  | } signifieth { | One half.         |
| $\frac{1}{3}$  |                | One third.        |
| $\frac{1}{4}$  |                | One fourth.       |
| $\frac{1}{5}$  |                | One fifth.        |
| $\frac{1}{6}$  |                | One sixth.        |
| $\frac{1}{7}$  |                | One seventh.      |
| $\frac{1}{8}$  |                | One eighth.       |
| $\frac{1}{9}$  |                | One ninth.        |
| $\frac{1}{10}$ |                | One tenth.        |
| $\frac{1}{11}$ |                | One eleventh.     |
| $\frac{1}{12}$ |                | One twelfth.      |
| $\frac{3}{4}$  |                | Three fourths.    |
| $\frac{5}{6}$  |                | Five sixths.      |
| $\frac{7}{8}$  |                | Seven eights, &c. |

T According

According to the said Direction, pronounce the following Fractions adding to them their several Denominations, thus.

$\frac{1}{2}$  £ (or the half of a Pound)  $\frac{3}{4}$  s (or the threefourths of a shilling)  $\frac{5}{6}$  d (or the five sixths of a penny, and so of the rest)  $\frac{7}{8}$  q,  $\frac{2}{3}$  lb,  $\frac{2}{3}$  Ounces,  $\frac{3}{4}$  Yard,  $\frac{1}{2}$  Ell,  $\frac{1}{2}$  Bushel,  $\frac{34}{47}$  Ship, &c.  
 $\frac{34}{57}$   $\frac{4}{15}$   $\frac{1}{100}$   $\frac{347}{331}$   $\frac{501}{501}$   $\frac{1718}{3417}$   $\frac{1007}{7003}$   $\frac{14872}{1000000}$  &c.

Being acquainted what a Fraction is, it followeth to know what a Fraction of a greater Denomination is worth in a lesser; for the attaining of which, consider what followeth.

1. The uppermost number of a Fraction is called *Numerator*, and the undermost *Denominator*: The *Numerator* shews the quantity of the parts, and the *Denominator* shews what names such parts bear, either Halves, Quarters, &c.

2. The *Numerator* ought to be less then the *Denominator*: for if it be equal or more, then such Fractions are called improper, as  $\frac{2}{1}$  is a whole, or  $1\frac{1}{2}$  is more then a whole; it is  $1\frac{1}{2}$  as you may see more at large in the second Book.

3. When you will know the worth of a Fraction in a lesser Denomination, then the Fraction is, Multiply the *Numerator* by so many small pieces or parts, as the whole doth contain, and divide the *Product* by the *Denominator*, the *Quotient* is the number required: As for example, If it be required to know, how many shillings  $\frac{3}{4}$  of a pound is worth, I multiply the *Numerator* 3 by 20 (because the whole pound is 20 s) the *Product* is 60: which 60 I divide by the *Denominator*

tor 4; the *Quotient* is 15  $\beta$ , for the answer of the question.

Further, if it be required to know how many ounces  $\frac{1}{2}$  lb is, do the same way, thus; Multiply the *Numerator* 5 by 16 (because 16 ounces makes 1 lb) the *Product* is 80, which 80 being divided by the *Denominator* 8, the *Quotient* is 10 ounces, for the answer of the Question, and so of the rest.

To make the Learner the more perfect in this, here followeth divers Questions of this nature, as a preparation to the *Rule of Practice*.

1. *Question.*

In  $\frac{1}{2}$   $\mathcal{L}$ , how many shillings? *facit* 12  $\beta$ , as followeth.

$$\begin{array}{r|l} 60 & 12 \beta \\ 5 & \text{Facit.} \\ \hline 55 & \end{array}$$

2. *Item*, In  $\frac{1}{4}$   $\mathcal{L}$ , how many  $\beta$ ? *facit* 13  $\beta$ .

3. *Item*, In  $\frac{1}{8}$   $\beta$ , how many  $\mathcal{Q}$ ? *facit* 10  $\mathcal{Q}$ .  
Multiply the *Numerator* by 12 (because 12  $\mathcal{Q}$  makes 1  $\beta$ ) and divide the *Product* by 6.

4. *Item*, In  $\frac{1}{4}$   $\beta$ , how many  $\mathcal{Q}$ ? *facit* 9  $\mathcal{Q}$ .

5. *Item*, In  $\frac{1}{8}$   $\beta$ , how many  $\mathcal{Q}$ ? *facit* 10  $\frac{1}{2}$   $\mathcal{Q}$ .

6. *Item*, In  $\frac{1}{16}$   $\beta$ , how many  $\mathcal{Q}$ ? *facit* 11  $\frac{1}{2}$   $\mathcal{Q}$ .

7. *Item*, In  $\frac{1}{3}$   $\mathcal{Q}$ , how many farthings? *facit* 2  $\frac{2}{3}$   $\mathcal{Q}$ .

8. *Item*, In  $\frac{1}{2}$   $\mathcal{Q}$ , how many  $\mathcal{Q}$ ? *facit* 3  $\frac{1}{2}$   $\mathcal{Q}$ .

T 2

9. *Item*,

9. *Item*, In  $\frac{1}{2}$   $\mathcal{L}$ , how many  $\text{q}$ ? *facit* 200  $\text{q}$ .
10. *Item*, In  $\frac{3}{4}$   $\beta$ , how many  $\text{q}$ ? *facit* 36  $\text{q}$ .
11. *Item*, In  $\frac{2}{3}$   $\mathcal{L}$ , how many  $\text{q}$ ? *facit* 384  $\text{q}$ .
12. *Item*, In  $\frac{1}{2}$   $\mathcal{L}$ , how many  $\beta$ ? *facit* 16  $\beta$  8  $\text{q}$ .
13. *Item*, In  $\frac{2}{3}$   $\beta$ , how many  $\text{q}$ ? *facit* 8  $\text{q}$ .
14. *Item*, In  $\frac{3}{4}$  of an hundred weight, how many  $\text{tb}$ ? *facit* 84  $\text{tb}$ .
15. *Item*, In  $\frac{1}{2}$   $\mathcal{C}$ , how many quarters? *facit* 3  $\frac{1}{2}$   $\text{qrs}$ .
16. *Item*, In  $\frac{3}{4}$   $\text{qrs}$ , how many  $\text{tb}$ ? *facit* 21  $\text{tb}$ .
17. *Item*, In  $\frac{7}{8}$   $\text{qrs}$ , how many  $\text{tb}$ ? *facit* 24  $\frac{1}{2}$   $\text{tb}$ .
18. *Item*, In  $\frac{7}{8}$   $\text{tb}$ , how many ounces? *facit* 14 ounces.
19. *Item*, In  $\frac{4}{5}$  ounces, how many drams? *facit* 6  $\frac{2}{5}$  drams.
20. *Item*, In  $\frac{3}{4}$  drams, how many scruples? *facit* 2  $\frac{1}{4}$  scruples.
21. *Item*, In  $\frac{2}{3}$  scruples, how many grains? *facit* 13  $\frac{1}{3}$  grains.
22. *Item*, In  $\frac{3}{4}$  Ells, how many quarters of a Yard? *facit* 3  $\frac{3}{4}$  quarters.
23. *Item*, In  $\frac{3}{4}$  Seam (or Quarters) how many Bushels? *facit* 6 Bushels.
24. *Item*, In  $\frac{3}{4}$  Pecks, how many Pints? *facit* 6 Pints.

Note.

The *Rule of Practice* is nothing else but a short operation of the *Rule of Three*, and consists chiefly in multiplying and dividing exactly in a compendious (or short) way, as is mentioned in the Second Part ; therefore I shall be the shorter here.

Here followeth (as an *Introduction* to the *Rule of Practice*, how to divide any number by a single figure, otherwise then is taught in *Division*, which will be a great help to the Learner, in the operation of the said *Rule of Practice*.

*How to divide by 2, or to take the half.*

In dividing by 2, or taking the half of any number, is the same thing ; the difference is onely this, That in taking the half, you spare the trouble of setting down the *Divisor* more then once, and of cutting the figures of the *Dividend* ; and also of setting the rest above the said *Dividend* (if there be any Rest) as followeth.

1. If it be required to divide 8642 by 2, (or to take the half of the said number,) what is the *Quotient* ? *facit* 4321.

The common way.

8642 (4321  
2222 *Facit*.

The shorter way.

2) 8642  
4321  
*Facit*.

T 3

I be-



*An Appendix.*

I begin at the left hand (in the shorter way) and say, The half of 8 is 4, the half of 6 is 3, the half of 4 is 2, and lastly, the half of 2 is 1; which figures 4321 I set under the line, as you see above.

*Note.*

In taking the part of any number, if you finde any Rest, every Unite so resting, must be accounted for so many Tens, (except at the last figure, or at the Unites) as the following examples doth shew.

2. Divide 9751 by 2, *facit* 4875½.

$$\begin{array}{r} 1) \quad 9751 \\ \underline{4875} \phantom{1} \\ 4875 \frac{1}{2} \end{array}$$

I begin at the left hand (as before) saying, The half of 9 is 4, rest 1 (which is 10) and 7 is 17, then the half of 17 is 8, rest 1, and 5 is 15, the half of 15 is 7, rest 1, and 1 is 11, the half of 11 is 5, rest 1, which is a half, the half of the whole number is then 4875½.

*How to take the third part.*

3. What is the third part of 8102? *facit* 2700⅔.

$$\begin{array}{r} 1) \quad 8102 \\ \underline{2700} \phantom{2} \\ 2700 \frac{2}{3} \end{array}$$

I say the third part of 8 is 2, rest 2 (which

20) and 1 is 21; the third of 21 is 7, then the third of 0 is 0, and the third of 2 is 0, rest  $\frac{2}{3}$ ; the *Quotient* is 2700 $\frac{2}{3}$ .

4. *Item*, What is the third part of 1107? *facit* 369.

*How to take the fourth part.*

5. What amounts the  $\frac{1}{4}$  of 3702? *facit* 925 $\frac{1}{4}$ .

$$\frac{1}{4}) \frac{3702}{925\frac{1}{4} \text{ or } \frac{1}{4}}$$

I say the  $\frac{1}{4}$  of 37 is 9, rest 1; then the  $\frac{1}{4}$  of 10 is 2, rest 2; then the  $\frac{1}{4}$  of 22 is 5, rest 2, which 2 is  $\frac{2}{4}$  or  $\frac{1}{2}$ .

6. *Item*, What is the  $\frac{1}{4}$  part of 11111? *facit* 2777 $\frac{1}{2}$ .

*How to take the fifth part.*

7. What is the  $\frac{1}{5}$  of 5015? *facit* 1003.

$$\frac{1}{5}) \frac{5015}{1003}$$

I say the  $\frac{1}{5}$  of 5 is 1, then the  $\frac{1}{5}$  of 0 is 0, then the  $\frac{1}{5}$  of 1 is 0, lastly, the  $\frac{1}{5}$  of 15 is 3: The whole *Quotient* is 1003.

8. *Item*, What is the  $\frac{1}{5}$  part of 5051? *facit* 1010 $\frac{1}{5}$ .

*How to take the sixth part.*

9. What is the sixth part of 11406? *facit* 1901.

$$\begin{array}{r} \frac{1}{6} \overline{) 11406} \\ 1901 \end{array}$$

Say the  $\frac{1}{6}$  part of 11 is 1, rest 5, and 4 is 54, then the  $\frac{1}{6}$  of 54 is 9, then the  $\frac{1}{6}$  of 0 is 0, and lastly, the  $\frac{1}{6}$  of 6 is 1; the *Quotient* is 1901, as you see above.

10. *Item*, What is the  $\frac{1}{6}$  part of 123456? *facit* 20576.

*How to take the seventh part.*

11. What is the seventh part of 151000? *facit* 21571 $\frac{3}{7}$ .

$$\begin{array}{r} \frac{1}{7} \overline{) 151000} \\ 21571\frac{3}{7} \end{array}$$

Say the  $\frac{1}{7}$  of 15 is 2, rest 1, then the  $\frac{1}{7}$  of 11 is 1, rest 4, then the  $\frac{1}{7}$  of 40 is 5, then the  $\frac{1}{7}$  of 50 is 7, and lastly, the  $\frac{1}{7}$  of 10 is 1, rest  $\frac{3}{7}$ ; the *Quotient* is 21571 $\frac{3}{7}$ , as you see above.

12. What is the  $\frac{1}{7}$  of 80117? *facit* 11445 $\frac{1}{7}$ .

*How to take the eighth part.*

13. What is the  $\frac{1}{8}$  part of 9009? *facit* 1126 $\frac{1}{8}$ .

$$\begin{array}{r} \frac{1}{8} \overline{) 9009} \\ 1126\frac{1}{8} \end{array}$$

Say

Say the  $\frac{1}{3}$  of 9 is 3, rest 6, then the  $\frac{1}{3}$  of 10 is 3, rest 1, then the  $\frac{1}{3}$  of 20 is 6, rest 8, lastly, the  $\frac{1}{3}$  of 49 is 16, rest 13; the *Quotient* is 1126 $\frac{1}{3}$ .

14. *Item*, What is the  $\frac{1}{3}$  part of 73081? *facit* 9135 $\frac{1}{3}$ .

*How to take the ninth part.*

15. What is the  $\frac{1}{9}$  of 126007? *facit* 14000 $\frac{7}{9}$ .

$$\begin{array}{r} \frac{1}{9} \overline{) 126007} \\ \underline{14000\frac{7}{9}} \end{array}$$

Say the  $\frac{1}{3}$  of 12 is 4, the  $\frac{1}{3}$  of 36 is 12, the  $\frac{1}{3}$  of 0 is 0, the  $\frac{1}{3}$  of 0 is 0, and the  $\frac{1}{3}$  of 7 is 2, rest 1; the *Quotient* is then 14000 $\frac{7}{9}$ , as you see above.

16. *Item*, What is the  $\frac{1}{9}$  part of 811458? *facit* 90162.

17. *Item*, What is the  $\frac{1}{12}$  part of 3480? *facit* 290.

To divide by 10, or to take the tenth part of any number the shortest way, hath been taught already in *Fol.* 140. which is to cut off the last figure of the *Dividend* towards the right hand.

18. *Item*, What is the  $\frac{1}{10}$  of 31879? *facit* 3187 $\frac{9}{10}$ .

19. *Item*, Divide 652812 by 12, *facit* 54401.

$$\begin{array}{r} \frac{1}{12} \overline{) 652812} \\ \underline{54401} \end{array}$$

Say the  $\frac{1}{12}$  part of 65 is 5, rest 5, then the  $\frac{1}{12}$  of

*An Appendix.*

of 52 is 4, rest 4, then the  $\frac{1}{12}$  of 48 is 4, then the  $\frac{1}{12}$  of 1 is 0, and the  $\frac{1}{12}$  of 12 is 1; the *Quotient* is 54401, as you see above.

*Another way.*

Instead of taking the  $\frac{1}{12}$  part at once, you may take first the sixth part, and the half of that sixth part is the number required, as followeth.

$$\begin{array}{r} \frac{1}{6} \quad 652812 \\ \hline 108802 \\ \frac{1}{2} \quad \hline 54401 \quad \text{Facit } 54401. \end{array}$$

*Otherwise.*

Instead of taking  $\frac{1}{6}$ , and the half of the said sixth part, you may take (if you please)  $\frac{1}{3}$  first, and  $\frac{1}{4}$  of that third part, is the number required, as followeth.

$$\begin{array}{r} \frac{1}{3} \quad 652812 \\ \hline 217604 \\ \frac{1}{4} \quad \hline 54401 \quad \text{Facit } 54401. \end{array}$$

Many more varieties of operations might be produced, but I forbear for brevity sake.

20. *Item*, Divide 304811 by 12, *facit* 25400 $\frac{11}{12}$ .

21. *Item*, Divide 3487 by 20, *facit* 174 $\frac{7}{20}$ .

To divide by 20, the shortest way hath been taught already, *Fol.* 207. which is to cut off the last



last figure of the *Dividend* towards the right hand, and take the half of the other figures, as followeth.

$$\begin{array}{r} 348 \overline{) 174} \\ \text{Facit } 174 \end{array}$$

22. Item, Divide 34817 by 20, *facit* 1740 $\frac{1}{2}$ .

*How to Multiply and Divide a Number of several Denominations by a Digit (or a single) Figure, without reducing it into its lesser Denomination.*

23. Multiply 3  $\mathcal{L}$  13  $\beta$  9  $\text{q}$  3  $\text{q}$  by 5, *facit* 18  $\mathcal{L}$  9  $\beta$  0  $\text{q}$  3  $\text{q}$ .

$$\begin{array}{r} \mathcal{L} \quad \beta \quad \text{q} \quad \text{q} \\ 3 - 13 - 9 - 3 \\ \hline \text{Facit } 18 - 09 - 0 - 3 \end{array}$$

I begin at the q, and say, Five times 3 q is 15 q, or 3  $\beta$  3 q. I set down 3 q, and carry the 3  $\text{q}$ , then 5 times 9  $\text{q}$  is 45, and 3 is 48  $\text{q}$ , which is just 4  $\beta$ . I set a cipher in the place of  $\text{q}$ , under the line, and carry 4  $\beta$ ; then 5 times 3  $\beta$  is 15, and 4 is 19  $\beta$ . I set down 9  $\beta$ , carry 1 Angel; then 5 times 1 Angel is 5 Angels, and 1 is 6 Angels, or 3  $\mathcal{L}$ . I set a cipher in the place of Angels, and carry 3  $\mathcal{L}$ . Lastly, 5 times 3  $\mathcal{L}$  is 15, and 3 I carried is 18  $\mathcal{L}$ , which 18 I set under

der the  $\mathcal{L}$ . The whole *Product* is 18  $\mathcal{L}$  9  $\beta$  0  $\mathcal{Q}$  3  $q$ . as before.

24. *Item*, Multiply 12  $\mathcal{L}$  15  $\beta$  6  $\mathcal{Q}$  by 3, *facit* 38  $\mathcal{L}$  6  $\beta$  6  $\mathcal{Q}$ .

25. *Item*, Multiply 134  $\mathcal{L}$  12  $\beta$  7  $\mathcal{Q}$  by 4, *facit* 538  $\mathcal{L}$  10  $\beta$  4  $\mathcal{Q}$ .

26. *Item*. Multiply 31  $\mathcal{L}$  19  $\beta$  8  $\mathcal{Q}$  by 6, *facit* 191  $\mathcal{L}$  18  $\beta$  0  $\mathcal{Q}$ .

27. *Item*. Multiply 29  $\mathcal{L}$  16  $\beta$  10  $\mathcal{Q}$  3  $q$  by 8, *facit* 238  $\mathcal{L}$  15  $\beta$  2  $\mathcal{Q}$  0  $q$ .

28. *Item*, Multiply 33  $\mathcal{L}$  17  $\beta$  3  $\mathcal{Q}$  1  $q$  by 10, *facit* 338  $\mathcal{L}$  12  $\beta$  8  $\mathcal{Q}$  2  $q$ .

29. *Item*, Multiply 134  $\mathcal{L}$  14  $\beta$  5  $\mathcal{Q}$  2  $q$  by 16, *facit* 2155  $\mathcal{L}$  11  $\beta$  4  $\mathcal{Q}$  0  $q$ .

$$\begin{array}{r}
 \mathcal{L} \quad \beta \quad \mathcal{Q} \quad q \\
 134 \text{ --- } 14 \text{ --- } 5 \text{ --- } 2 \\
 \hline
 538 \text{ --- } 17 \text{ --- } 10 \text{ --- } 0 \\
 \hline
 2155 \text{ --- } 11 \text{ --- } 4 \text{ --- } 0
 \end{array}
 \begin{array}{l}
 (4) \\
 (4)
 \end{array}$$

*Note*, 16 being too troublesome for the Learner to Multiply at once, I Multiply twice by 4, because 4 times 4 is 16, as you see above.

30. *Item*, Multiply 31  $\mathcal{L}$  11  $\beta$  3  $\mathcal{Q}$  3  $q$  by 16, *facit* 505  $\mathcal{L}$  1  $\beta$  0  $\mathcal{Q}$  0  $q$ .

31. *Item*, Multiply 43  $\mathcal{L}$  15  $\beta$  9  $\mathcal{Q}$  1  $q$  by 12, *facit* 525  $\mathcal{L}$  9  $\beta$  3  $\mathcal{Q}$  0  $q$ .

32. *Divide* 26  $\mathcal{L}$  13  $\beta$  6  $\mathcal{Q}$  2  $q$  by 3, *facit* 8  $\mathcal{L}$  17  $\beta$  10 0  $\frac{2}{3}$   $q$ .

$\mathcal{L}$

$$\begin{array}{r}
 \mathcal{L} \quad \beta \quad \mathcal{G} \quad q \\
 26 \text{ --- } 13 \text{ --- } 6 \text{ --- } 2 \\
 3) \text{ --- } \text{ --- } \text{ --- } \text{ ---} \\
 8 \text{ --- } 17 \text{ --- } 10 \text{ --- } 0 \frac{2}{3} \\
 \text{facit}
 \end{array}$$

I begin at the  $\mathcal{L}$ , saying the third part of 26  $\mathcal{L}$  is 8  $\mathcal{L}$ , which 8 I set down under the line, thereremains 2  $\mathcal{L}$ , which is 4 Angels, and 1 Angel is 5 Angels, the third part of 5 Angels is 1 Angel; I set 1 in the place of Angels under the line, there rest 2 Angels and 3  $\beta$  is 23  $\beta$ , the third part of 23  $\beta$  is 7, rest 2  $\beta$ . I set down 7  $\beta$ , then 2  $\beta$  that remains and 6  $\mathcal{G}$ , is 30  $\mathcal{G}$ , the third part of 30 is 10  $\mathcal{G}$ . I set down 10  $\mathcal{G}$ , then the third part of 2  $q$  is 0, rest  $\frac{2}{3} q$ , which I set in the place of  $q$  under the line, the *Quotient* is then 8  $\mathcal{L}$  17  $\beta$  10  $\mathcal{G}$  0  $\frac{2}{3} q$ , as you see above.

33. Divide 47  $\mathcal{L}$  16  $\beta$  7  $\mathcal{G}$  0  $q$  by 4, *facit* 11  $\mathcal{L}$  19  $\beta$  1  $\mathcal{G}$  3  $q$ .

34. *Item*, divide 124  $\mathcal{L}$  13  $\beta$  3  $\mathcal{G}$  2  $q$  by 5, *facit* 24  $\mathcal{L}$  18  $\beta$  7  $\mathcal{G}$  3  $\frac{3}{5} q$ .

35. *Item*, divide 13  $\mathcal{L}$  0  $\beta$  0  $\mathcal{G}$  3  $q$  by 6, *facit* 2  $\mathcal{L}$  3  $\beta$  4  $\mathcal{G}$  0  $\frac{1}{2}$  or  $\frac{1}{3} q$ .

36. *Item*, divide 648  $\mathcal{L}$  14  $\beta$  1  $\mathcal{G}$  0  $q$  by 7, *facit* 92  $\mathcal{L}$  13  $\beta$  5  $\mathcal{G}$  1  $\frac{1}{7} q$ .

37. *Item*, divide 100  $\mathcal{L}$  5  $\beta$  4  $\mathcal{G}$  3  $q$  by 8, *facit* 12  $\mathcal{L}$  10  $\beta$  8  $\mathcal{G}$  0  $\frac{3}{8} q$ .

38. *Item*, divide 131  $\mathcal{L}$  8  $\beta$  11  $\mathcal{G}$  1  $q$  by 9, *facit* 14  $\mathcal{L}$  12  $\beta$  1  $\mathcal{G}$  1  $q$ .

39. *Item*, divide 55  $\mathcal{L}$  14  $\beta$  0  $\mathcal{G}$  3  $q$  by 15, *facit* 3  $\mathcal{L}$  14  $\beta$  3  $\mathcal{G}$  1  $q$ .

$\mathcal{L}$ .

*An Appendix.*

|    | ℒ  | β    | q   | q   |
|----|----|------|-----|-----|
|    | 55 | — 14 | — 0 | — 3 |
| 5) |    |      |     |     |
|    | 11 | — 02 | — 9 | — 3 |
| 3) |    |      |     |     |
|    | 3  | — 14 | — 3 | — 1 |

Instead of taking the  $\frac{1}{3}$  part at once, I take first the  $\frac{1}{2}$  part, and  $\frac{1}{3}$  of it is the *Quotient* required, as you see above.

40. *Item*, divide 362 ℒ 12 β 8 q 0 q by 16, *facit* 22 ℒ 13 β 3 q 2 q.

*Note.*

The Learner being well acquainted with what hath been mentioned already (concerning the short way of **M**ultiplying and **D**ividing) will find no great difficulty in the following **Q**uestions.

But first of all, It is absolutely necessary to understand the following Tables which are the ground-work of all, without which no considerable progress can be made in the Rule of Practice.

*The*

# *The First Table of Practice, shewing the even Parts of a Shilling in Pence.*

Pence.

|     |   |    |   |      |  |  |
|-----|---|----|---|------|--|--|
| For | { | 1  | } | Take | $\frac{1}{12}$ or $\frac{1}{4}$ , and the $\frac{1}{4}$ of it is the answer.   |  |
|     |   | 2  |   |      | $\frac{1}{8}$  |  |
|     |   | 3  |   |      | $\frac{1}{4}$  |  |
|     |   | 4  |   |      | $\frac{1}{3}$  |  |
|     |   | 5  |   |      | 3 and 2, 3 is $\frac{1}{4}$ , and 2 is $\frac{1}{8}$ .                         |  |
|     |   | 6  |   |      | $\frac{1}{2}$  |  |
|     |   | 7  |   |      | 4 and 3, 4 is $\frac{1}{3}$ , and 3 is $\frac{1}{4}$ .                         |  |
|     |   | 8  |   |      | 6 and 2, 6 is $\frac{1}{3}$ , and 2 is $\frac{1}{8}$ .                         |  |
|     |   | 9  |   |      | 6 and 3, 6 is $\frac{1}{2}$ , and 3 is $\frac{1}{4}$ .                         |  |
|     |   | 10 |   |      | 6 and 4, 6 is $\frac{2}{3}$ , and 4 is $\frac{1}{3}$ .                         |  |
|     |   | 11 |   |      | 6: 3 and 2, 6 is $\frac{1}{2}$ , 3 is $\frac{1}{4}$ , and 2 is $\frac{1}{8}$ . |  |

*The Second Table (shewing the even Parts of a  
Pound in Shillings) followeth.*

*The*



## The Second Table of Practice.

| Shillings. |      |  |
|------------|------|--|
| 1          |      | $\frac{1}{2}$ . or $\frac{1}{2}$ , and the $\frac{1}{2}$ of it is the answer.                |
| 2          |      | $\frac{1}{10}$ .   |
| 3          |      | 2 and 1, 2 is $\frac{1}{10}$ and 1 is $\frac{1}{20}$ of the half of 2.                       |
| 4          |      | $\frac{1}{5}$ .  |
| 5          |      | $\frac{1}{4}$ .  |
| 6          |      | 4 and 2, 4 is $\frac{1}{5}$ , and 2 is $\frac{1}{10}$ or $\frac{1}{2}$ of 4.                 |
| 7          |      | 5 and 2, 5 is $\frac{1}{4}$ , and 2 is $\frac{1}{10}$ .                                      |
| 8          |      | 4 and 4, taking $\frac{1}{5}$ for each 4 $\beta$ .   |
| 9          |      | 5 and 4, 5 is $\frac{1}{4}$ , and 4 is $\frac{1}{5}$ .                                       |
| 10         |      | $\frac{1}{2}$ .  |
| 11         |      | 10 and 1, 10 is $\frac{1}{2}$ , and 1 is $\frac{1}{20}$ or $\frac{1}{10}$ of 10 $\beta$ .    |
| For 12     | Take | 10 and 2, 10 is $\frac{1}{2}$ , and 2 is $\frac{1}{10}$ or $\frac{1}{5}$ of 10 $\beta$ .     |
| 13         |      | 10: 2 and 1, 10 is $\frac{1}{2}$ , 2 is $\frac{1}{10}$ and 1 is $\frac{1}{2}$ of 2 $\beta$ . |
| 14         |      | 10 and 4, 10 is $\frac{1}{2}$ , and 4 is $\frac{1}{5}$ .                                     |
| 15         |      | 10 and 5, 10 is $\frac{1}{2}$ , and 5 is $\frac{1}{2}$ or $\frac{1}{2}$ of 10 $\beta$ .      |
| 16         |      | 10: 4 and 2, 10 is $\frac{1}{2}$ , 4 is $\frac{1}{5}$ and 2 is $\frac{1}{10}$ .              |
| 17         |      | 10: 5 and 2, 10 is $\frac{1}{2}$ , 5 is $\frac{1}{2}$ and 2 is $\frac{1}{10}$ .              |
| 18         |      | 10: 4 and 4, 10 is $\frac{1}{2}$ , and for each 4 take $\frac{1}{5}$ .                       |
| 19         |      | 10: 5 and 4, 10 is $\frac{1}{2}$ , 5 is $\frac{1}{2}$ and 4 is $\frac{1}{5}$ . The           |

The Third Table, shewing the even Parts of  
1 lb Averdupois weight in ounces.

|     |    |      |  |
|-----|----|------|--|
| For | 1  | Take | $\left(\frac{1}{8}\right.$ or $\frac{1}{4}$ , and $\frac{1}{4}$ of that $\frac{1}{4}$ is the<br>answer.                          |
|     | 2  |      | $\frac{1}{8}$  |
|     | 3  |      | 2 and 1, 2 is $\frac{1}{2}$ , and 1 is $\frac{1}{2}$ of<br>2 ounces.   |
|     | 4  |      | $\frac{1}{4}$  |
|     | 5  |      | 4 and 1, 4 is $\frac{1}{4}$ , and 1 is $\frac{1}{4}$ of<br>4 ounces.   |
|     | 6  |      | 4 and 2, 4 is $\frac{1}{2}$ , and 2 is $\frac{1}{2}$ of<br>4 ounces.   |
|     | 7  |      | 4: 2 and 1, 4 is $\frac{1}{4}$ , 2 is $\frac{1}{2}$ of<br>4, and 1 is $\frac{1}{2}$ of 2.  |
|     | 8  |      | $\frac{1}{2}$  |
|     | 9  |      | 8 and 1, 8 is $\frac{1}{8}$ , and 1 is $\frac{1}{8}$ of<br>8 ounces.   |
|     | 10 |      | 8 and 2, 8 is $\frac{1}{4}$ , and 2 is $\frac{1}{4}$ of<br>8 ounces.   |
|     | 11 |      | 8: 2 and 1, 8 is $\frac{1}{8}$ , 2 is $\frac{1}{4}$ of 8,<br>and 1 is $\frac{1}{2}$ of 2 ounces.                                 |
|     | 12 |      | 8 and 4, 8 is $\frac{1}{2}$ , and 4 is $\frac{1}{2}$ of<br>8 ounces.   |
|     | 13 |      | 8: 4 and 1, 8 is $\frac{1}{8}$ , 4 is $\frac{1}{2}$ of 8,<br>and 1 is $\frac{1}{2}$ of 4.  |
|     | 14 |      | 8: 4 and 2, 8 is $\frac{1}{4}$ , 4 is $\frac{1}{2}$ of 8,<br>and 2 is $\frac{1}{2}$ of 4.  |
|     | 15 |      | 8: 4: 2: and 1, 8 is $\frac{1}{8}$ , 4 is $\frac{1}{2}$<br>of 8, 2 is $\frac{1}{2}$ of 4, and 1 is<br>$\frac{1}{2}$ of 2 ounces. |

V

1 Quest.

## 1 Question.

If 1 Yard of cloth (or 1 lb) cost 6 q, what cost 96 Yards (or lb)? *facit* 48 β.

$$\begin{array}{r} \text{Yard} \quad \text{q} \quad \text{Yards} \\ 1 \text{ --- } 6 \text{ --- } 96 \\ \hline \end{array}$$

6 q is  $\frac{1}{2}$  β ----- 48 β, *facit* 48 β.

6 q is the half of 1 β; therefore I take the  $\frac{1}{2}$  of 96, the *Quotient* is 48 β, as you see above.

2. Item, If 1 lb cost 6 q, what cost 864 lb? *facit* 21 £ 12 β.

3. Item, If 1 lb cost 6 q, what cost 391 lb? *facit* 9 £ 15 β 6 q.

In taking the  $\frac{1}{2}$  of 391, there will rest 1, which is  $\frac{1}{2}$  β or 6 q, as followeth.

$$\begin{array}{r} \text{lb} \quad \text{q} \quad \text{lb} \\ 1 \text{ --- } 6 \text{ --- } 391 \\ \hline \end{array}$$

6 q is  $\frac{1}{2}$  of 1 β --- 19 | 5 - 6 q

*Facit* 9 £ 15 β 6 q.

4. Item, If 1 Yard cost 6 q, what cost 561 Yards? *facit* 14 £ 0 β 6 q.

5. Item, If 1 Yard cost 3 q, what cost 64 Yards? *facit* 16 β.

6. Item, What cost 167 lb at 3 q the lb? *facit* 41 β 9 q.

7. Item

7. *Item*, What cost 287 lb at 4 s the lb?  
*facit* 4 £ 15 s 8 d.

8. *Item*, What cost 720 Ells at 2 s the Ell?  
*facit* 6 £.

9. *Item*, 69 Yards at 2 s the Yard, what amounts the whole? *facit* 11 s 6 d.

10. *Item*, What cost 144 lb at 1 s the lb?  
*facit* 12 s.

11. *Item*, What cost 249 lb at 1 s the lb?  
*facit* 20 s 9 d.

12. *Item*, What cost 84 lb at 9 s the lb?  
*facit* 3 £ 3 s.

$$\begin{array}{r} \text{lb} \qquad \qquad \text{s} \qquad \qquad \text{lb} \\ 1 \text{ --- } 9 \text{ --- } 84 \\ \hline \end{array}$$

$$6 \text{ s is } \frac{1}{2} \text{ of } 1 \text{ s} \text{ ----- } 42$$

$$3 \text{ s is } \frac{1}{2} \text{ of } 6 \text{ s} \text{ ----- } 21$$

$$\begin{array}{r} 63 \text{ s} \\ \text{Facit } 3 \text{ £ } 3 \text{ s.} \end{array}$$

13. *Item*, What cost 89 lb at 9 s the lb?  
*facit* 3 £ 6 s 9 d.

14. *Item*, If 1 lb cost 8 s, what cost 101 lb?  
*facit* 3 £ 7 s 4 d.

15. *Item*, If 1 Yard cost 7 s, what cost 124 Yards? *facit* 3 £ 12 s 4 d.

16. *Item*, If 1 Yard cost 11 s, what cost 281 Yards? *facit* 12 £ 17 s 7 d.

| Yard                        | 9     | Yards   |
|-----------------------------|-------|---------|
| 1                           | 11    | 281     |
| 6 9 is $\frac{1}{2}$ of 1 9 | ----- | 140 - 6 |
| 3 9 is $\frac{1}{3}$ of 6 9 | ----- | 70 - 3  |
| 2 9 is $\frac{1}{3}$ of 6 9 | ----- | 46 - 10 |
|                             |       | <hr/>   |
|                             |       | 257 - 7 |

Facit 12 £ 17 9 9

*Otherwise.*

If the Yard had been worth 1 9, then 281 Yards would be worth 281 9; but the Yard is worth but 11 9, which is  $\frac{1}{2}$  part of 1 9 less; therefore take  $\frac{1}{2}$  of 281 and subtract the *Quo-*  
*tient* from it, the rest will be 257 9 7 9, or  
12 £ 17 9 7 9 as before, thus.

$$\begin{array}{r}
 281 \text{ Yards.} \\
 \frac{1}{2} \text{ --- } 23 - 5 \\
 \hline
 257 - 7 \\
 \hline
 \end{array}$$

Facit - 12 £ 17 9 7 9.

17. *Item*, What cost 360 lb at 11 9 the lb?  
facit 16 £ 10 9.

18. *Item*, What cost 84 lb at 5 9 the lb?  
facit 35 9.

19. *Item*, 121 Yards at 10 9, facit 5 £  
c 9 10 9.

20. *Item*,



20. Item, 303 lb at 10 s the lb, facit 12 £  
12 s 6 d.

21. Item, What cost 137 Yards at 10 s the  
Yard? facit 68 £ 10 s.

|      |    |       |
|------|----|-------|
| Yard | s  | Yards |
| 1    | 10 | 137   |

10 s is  $\frac{1}{2}$  £ ----- 68-10 s.  
Facit.

22. Item, If 1 lb cost 5 s, what 76 lb?  
facit 19 £.

23. Item, 567 Ells at 4 s the Ell, facit 113  
£ 8 s.

24. Item, 840 lb at 2 s the lb, facit 84 £.

25. Item, 259 lb at 2 s the lb, facit 25 £  
18 s.

26. Item, 403 lb at 5 s the lb, facit 100 £  
15 s.

27. Item, 124 Ells at 15 s the Ell, facit  
93 £.

|     |    |      |
|-----|----|------|
| Ell | s  | Ells |
| 1   | 15 | 124  |

10 s is  $\frac{2}{3}$  of 1 £ ----- 62

5 s is  $\frac{1}{3}$  of 10 s ----- 31

Facit 93 £.

28. Item, 177 Ells at 15 s the Ell, facit  
132 £ 15 s.

V 3

29. Item,

*An Appendix.*

29. *Item*, 126 lb at 6  $\beta$  the lb, *facit* 37  $\mathcal{L}$  16  $\beta$ .
30. *Item*, 310 lb at 8  $\beta$  the lb, *facit* 124  $\mathcal{L}$ .
31. *Item*, 521 lb at 14  $\beta$  the lb, *facit* 364  $\mathcal{L}$  14  $\beta$ .
32. *Item*, 135 lb at 12  $\beta$  the lb, *facit* 81  $\mathcal{L}$ .
33. *Item*, 99 Ells at 11  $\beta$  the Ell, *facit* 54  $\mathcal{L}$  9  $\beta$ .
34. *Item*, 477 lb at 1  $\beta$  the lb, *facit* 23  $\mathcal{L}$  17  $\beta$ .
35. *Item*, 69 lb at 3  $\beta$  the lb, *facit* 10  $\mathcal{L}$  7  $\beta$ .
36. *Item*, 325 Ells at 7  $\beta$  the Ell, *facit* 113  $\mathcal{L}$  15  $\beta$ .
37. *Item*, 264 Yards at 9  $\beta$  the Yard, *facit* 118  $\mathcal{L}$  16  $\beta$ .
38. *Item*, 168 lb at 13  $\beta$  the lb, *facit* 109  $\mathcal{L}$  4  $\beta$ .
39. *Item*, 112 Ells at 16  $\beta$  the Ell, *facit* 89  $\mathcal{L}$  12  $\beta$ .
40. *Item*, 216 Ells at 19  $\beta$  the Ell, *facit* 205  $\mathcal{L}$  4  $\beta$ .
41. *Item*, 316 lb at 18  $\beta$  the lb, *facit* 284  $\mathcal{L}$  8  $\beta$ .
42. *Item*, 161 lb at 17  $\beta$  the lb, *facit* 136  $\mathcal{L}$  17  $\beta$ .
43. *Item*, If 1 Yard cost 3  $\beta$  6  $\mathcal{G}$ , what cost 62 Yards? *facit* 10  $\mathcal{L}$  17  $\beta$ .

Yard     $\beta$      $\text{q}$     Yards

1 — 3 — 6 — 62

3-6  $\text{q}$ .

186

6  $\text{q}$  is  $\frac{1}{2}$  of 1  $\beta$  ---- 31

2 1|7

Facit 10  $\mathcal{L}$  17  $\beta$  .

Another way.

Yard     $\beta$      $\text{q}$     Yards

1 — 3 — 6 — 62

2  $\beta$  is  $\frac{1}{10}$   $\mathcal{L}$  ---- 6-4

1  $\beta$  is  $\frac{1}{2}$  of 2  $\beta$  -- 3-2

6  $\text{q}$  is  $\frac{1}{2}$  of 1  $\beta$  -- 1-11

Facit 10-17  $\beta$

44. Item, If 1 Yard cost 2  $\beta$  4  $\text{q}$ , what cost  
35 Yards? facit 4  $\mathcal{L}$  1  $\beta$  8  $\text{q}$ .

45. Item, 116  $\text{th}$  at 5  $\beta$  6  $\text{q}$  the  $\text{th}$ , facit  
31  $\mathcal{L}$  18  $\beta$ .

46. Item, 58 Ells at 11  $\beta$  8  $\text{q}$  the Ell, facit  
33  $\mathcal{L}$  16  $\beta$  8  $\text{q}$ .

47. Item, 36 Yards at 12  $\beta$  7  $\text{q}$  the Yard,  
facit 22  $\mathcal{L}$  13  $\beta$ .

48. Item, 47 Ells at 18  $\beta$  2  $\text{q}$  the Ell, facit  
42  $\mathcal{L}$  13  $\beta$  10  $\text{q}$ .

V 4

49. Item,

49. Item, 144 tb at 19  $\beta$  1  $\text{q}$  the tb, facit  
137  $\text{L}$  8  $\beta$ .

50. Item, 197 tb at 10  $\beta$  3  $\text{q}$  the tb, facit  
100  $\text{L}$  19  $\beta$  3  $\text{q}$ .

51. Item, 300 tb at 14  $\beta$  5  $\text{q}$  the tb, facit  
216  $\text{L}$  5  $\beta$ .

52. Item, 27 Yards at 34  $\beta$  11  $\text{q}$  the Yard,  
facit 47  $\text{L}$  2  $\beta$  9  $\text{q}$ .

53. Item, 126 Ells at 2  $\text{L}$  10  $\beta$  the Ell,  
facit 315  $\text{L}$ .

54. Item, 135 Bays at 4  $\text{L}$  17  $\beta$ , facit  
654  $\text{L}$  15  $\beta$ .

|     |            |         |              |
|-----|------------|---------|--------------|
| Bay | $\text{L}$ | $\beta$ | Bays         |
| 1   | —          | 4       | 17           |
|     |            |         | 135          |
|     |            |         | 4-17 $\beta$ |

|   |       |         |
|---|-------|---------|
|   |       | 540     |
| 10 $\beta$ is $\frac{1}{2}$ of 1 $\text{L}$ | ----- | 67 — 10 |
| 5 $\beta$ is $\frac{1}{4}$ of 10 $\beta$    | ----- | 33 — 15 |
| 2 $\beta$ is $\frac{1}{5}$ of 10 $\beta$    | ----- | 13 — 10 |

Facit 654 — 15  $\beta$

55. Item, 135 Pieces at 3  $\text{L}$  17  $\beta$ , facit  
519  $\text{L}$  15  $\beta$ .

56. Item, 75 Pieces at 7  $\text{L}$  18  $\beta$ , facit 592  
 $\text{L}$  10  $\beta$ .

57. Item, 18 Says at 5  $\text{L}$  3  $\beta$  the Piece,  
facit 92  $\text{L}$  14  $\beta$ .

58. Item, 56 Bays at 4  $\text{L}$  14  $\beta$  the Piece,  
facit 263  $\text{L}$  4  $\beta$ .

59. Item,

*An Appendix.*

293

59. Item, 47 Pieces at 3 £ 11 β 6 q, fa-  
cit 168 £ 0 β 6 q.

| Piece                        | £     | β    | q   | Pieces                    |
|------------------------------|-------|------|-----|---------------------------|
| 1                            | — 3 — | 11 — | 6 — | 47                        |
|                              |       |      |     | 3 — 11 — 6                |
|                              |       |      |     | <u>141</u>                |
| 10 β is $\frac{1}{2}$ of 1 £ | ----- |      |     | 23 — 10 — 0               |
| 1 β is $\frac{1}{2}$ of 10 β | ----- |      |     | 2 — 07 — 0                |
| 6 q is $\frac{1}{2}$ of 1 β  | ----- |      |     | 1 — 03 — 6                |
|                              |       |      |     | <u>Facit 168 — 00 — 6</u> |

*Another way.*

| Piece                       | £     | β    | q   | Pieces                     |
|-----------------------------|-------|------|-----|----------------------------|
| 1                           | — 3 — | 11 — | 6 — | 47                         |
|                             | 20    |      |     | 71                         |
|                             |       |      |     | <u>71 β</u>                |
|                             |       |      |     | 47                         |
|                             |       |      |     | 329                        |
| 6 q is $\frac{1}{2}$ of 1 β | ----- |      |     | 23 — 6                     |
|                             |       |      |     | <u>336   0 — 6</u>         |
|                             |       |      |     | <u>Facit 168 £ 0 β 6 q</u> |

60. Item, 47 Pieces at 2 £ 11 β 6 q, facit  
121 £ 0 β 6 q.

61. Item, 82 Pieces at 4 £ 16 β 7 q, facit  
395 £ 19 β 10 q.

62. Item,



## An Appendix.

62. Item, 138 Pieces at 5 L 6 β 8 q the Piece, facit 736 L.

63. Item, 56 lb at 3 L 10 β 2 q the lb, facit 196 L 9 β 4 q.

$$\begin{array}{r}
 \text{lb} \quad \text{L} \quad \beta \quad \text{q} \quad \text{lb} \\
 1-3-10-2-56 \\
 \hline
 3-10-2 \text{ q}
 \end{array}$$

$$\begin{array}{r}
 168 \\
 10 \beta \text{ is } \frac{1}{2} \text{ of } 1 \text{ L}-28-0-0 \\
 \text{Suppose } x \beta \text{ is } \frac{1}{12} \text{ of } x0 \beta -x-26-0 \\
 2 \text{ q is } \frac{1}{2} \text{ of } 1 \beta \text{ --- } 0-9-4 \\
 \hline
 \hline
 \end{array}$$

Facit 196-9-4

Otherwise.

$$\begin{array}{r}
 \text{lb} \quad \text{L} \quad \beta \quad \text{q} \quad \text{lb} \\
 1-3-10-2-56 \\
 \hline
 20 \qquad \qquad 70 \beta 2 \text{ q}
 \end{array}$$

$$\begin{array}{r}
 70 \beta 2 \text{ q} \quad 3920 \\
 2 \text{ q is } \frac{1}{2} \text{ of } 1 \beta \text{ --- } 9-4 \\
 \hline
 \hline
 3929-4
 \end{array}$$

Facit 196 L 9 β 4 q

64. Item, 78 lb at 2 L 0 β 6 q, facit 157 L 19 β.

65. Item, 32 lb at 5 q 2 q the lb, facit 14 β 8 q.

66. Item,

66. Item, 13 lb at 3 9 3 q the lb, facit 4 9 3 q.

67. Item, 24 Yards 2 Quarters at 6 9 8 q the Yard, facit 8 9 3 9 4 q.

|      |       |     |       |         |
|------|-------|-----|-------|---------|
| Yard | 9     | q   | Yards | Quarter |
| 1    | — 6 — | 8 — | 24    | — 2     |
|      |       |     | 6 —   | 8 9     |

|                             |           |
|-----------------------------|-----------|
|                             | 144       |
| 6 9 is $\frac{1}{2}$ of 1 9 | — 12      |
| 2 9 is $\frac{1}{3}$ of 6 9 | — 4       |
| 2 Qr is $\frac{1}{4}$ Yard  | — 3 — 4   |
|                             | 16 13 — 4 |

Facit 8 9 3 9 4 q

68. Item, If 1 Yard cost 3 9 9 q, what cost 9 Yards and 1 Quarter, facit 34 9 8 q.

69. Item, What cost 4 Ells and 1 Quarter of a Yard, if 1 Ell cost 5 9 10 q, facit 24 9 6 q.

70. Item, What cost 24 Yards 3 Quarters and a half at 9 9 4 q the Yard, facit 11 9 12 9 2 q.

Yard

|      |   |   |          |
|------|---|---|----------|
| Yard | β | q | Yards.   |
| 1    | — | 9 | — 4 — 24 |
|      |   |   | 9 — 4 q  |
|      |   |   | —————    |

216

$$4 \text{ q is } \frac{1}{3} \text{ of } 1 \text{ β} \text{ --- } 8 \text{ --- } 0$$

$$2 \text{ Quar: is } \frac{1}{2} \text{ Yard --- } 4 \text{ --- } 8$$

$$1 \text{ Quar: is } \frac{1}{2} \text{ of } 2 \text{ Quar: --- } 2 \text{ --- } 4$$

$$\frac{1}{2} \text{ Quar: is } \frac{1}{2} \text{ of } 1 \text{ Quar: --- } 1 \text{ --- } 2$$

23|2—2

Facit 11 L 12 β 2 q

71. Item, What cost 7 Yards  $\frac{1}{2}$  and a half quarter, at 5 β 8 q the Yard? facit 44 β 7 q 2 q.

72. Item, What cost 57 Yards at 3  $\frac{1}{2}$  L the Yard? facit 199  $\frac{1}{2}$  L.

73. Item, What cost 47 Pieces at 8  $\frac{1}{4}$  L the Piece? facit 411  $\frac{1}{4}$  L.

74. Item, What cost 7  $\frac{1}{3}$  Yards at 10 β 6 q the Yard? facit 3 L 17 β 0 q.

75. Item, What cost 7 Pieces at 2 L 12 β 3 q the Piece? facit 18 L 5 β 9 q.

|      |   |   |              |       |
|------|---|---|--------------|-------|
| Yard | L | β | q            | Yards |
| 1    | — | 2 | — 12 — 3 — 7 |       |
|      |   |   | ————— (7     |       |

Facit 18—05—9

76. Item, What cost 5 Yards at 18 β 6 q the Yard? facit 4 L 12 β 6 q.

77. Item,

77. Item, What cost 10 lb 8 ounces at 13 β  
7 9 2 q the lb? *facit* 7 L 3 β 0 9 3 q.

78. Item, What cost 6½ lb at 16 β 8 9 1 q  
the lb? *facit* 5 L 5 β 8 9 1 q.

79. Item, What cost 87 lb 12 ounces at 3 β  
7 9 the lb? *facit* 15 L 14 β 5 9 1 q.

80. Item, What cost 25 Pieces at 2 L 13 β  
2 9 the Piece? *facit* 66 L 9 β 2 9.

Piece L β 9 Pieces

1 — 2 — 13 — 2 — 25

————— (5

13 — 05 — 10

————— (5

*Facit* 66 — 09 — 2

81. Item, If 1 Bay cost 3 L 15 β 9 9,  
what cost 16 Bays? *facit* 60 L 12 β.

82. Item, What cost 2 lb at 3 9 2 q the  
ounce? *facit* 9 β 4 9.

83. If 1 lb of Cheese cost 2 9 1 q, what cost  
16 lb? *facit* 3 β.

84. If 1 lb cost 3 9 2 q, what cost 12 lb  
8 ounces? *facit* 3 β 7 9 3 q.

85. Item, What cost 9 score and 5 lb of Beef  
at 4 β 8 9 the score? *facit* 43 β 2 9.

Score β 9 Score lb

1 — 4 — 8 — 9 — 5

4 — 8 9

36

6 9 is ½ of 1 β — — — 4 — 6

2 9 is ⅓ of 6 9 — — — 1 — 6

5 lb is ¼ of 1 Score — 1 — 2

*Facit* 43 — 2 9

86. Item,

86. *Item*, What cost 8 Score and 15 lb, at 5  $\beta$  4  $\text{q}$  the Score? *facit* 46  $\beta$  8  $\text{q}$ .

87. *Item*, What cost 16 Hundred 2 Quarters of Iron at 18  $\beta$  6  $\text{q}$  the Hundred? *facit* 15  $\text{L}$  5  $\beta$  3  $\text{q}$ .

88. *Item*, What cost 6 C. 3 quarters 14 lb at 16  $\beta$  8  $\text{q}$  the Hundred? *facit* 5  $\text{L}$  14  $\beta$  7  $\text{q}$ .

89. *Item*, What cost 5 Packs of Wool at 9  $\text{q}$  the lb? *facit* 45  $\text{L}$ .

*Note*, One Pack of Wool contains so many lb as there is Pence in 1 Pound sterling, which is 240; therefore upon that ground it doth appear, that so many  $\text{q}$  as 1 lb of Wool is worth, so many Pounds sterling is 1 Pack worth, that is to say, If 1 lb cost 6  $\text{q}$ , the Pack cost 6  $\text{L}$ : If the lb cost 9  $\text{q}$ , the Pack must cost 9  $\text{L}$ .

Further observe also, That if you finde any odde Farthings in the price of 1 lb of Wool (as 9  $\text{q}$  2  $\text{q}$ , &c.) then for every farthing, you must reckon a Crown (or 5  $\beta$ ) to be added to the sum, as the following examples will shew.

90. *Item*, If 1 lb of Wool cost 8  $\text{q}$  2  $\text{q}$ , what cost 1 Pack? *facit* 8  $\text{L}$  10  $\beta$ .

At 8  $\text{q}$  the lb, the Pack is 8  $\text{L}$ : Now for the 2  $\text{q}$  I take 2 Crowns, which is 10  $\beta$ , the Pack cost then 8  $\text{L}$  10  $\beta$ , as above.

91. If 1 lb of Wool cost 11  $\text{q}$  1  $\text{q}$ , what cost 16 Packs? *facit* 180  $\text{L}$ .



|      |                     |     |             |
|------|---------------------|-----|-------------|
| Pack | ℒ                   | β   | Packs       |
| 1    | —                   | 11  | —           |
|      |                     | 5   | —           |
|      |                     |     | 16          |
|      |                     |     | 11-5 β      |
|      |                     |     | 16          |
|      |                     |     | 16          |
| 5 β  | is $\frac{1}{4}$ of | 1 ℒ | — — — 4     |
|      |                     |     | Facit 180 ℒ |

92. Item, What cost 12 Packs of Wool at 13  $\text{q}$  3  $\text{q}$  the  $\text{lb}$ ? *facit* 165 ℒ.

93. If 1  $\text{lb}$  cost 12  $\text{q}$  2  $\text{q}$ , what cost 11 Packs and 6 scores  $\text{lb}$ ? *facit* 143 ℒ 15 β.

*Note*, In buying (or selling) Wool by the Pack, if you finde any odd scores (or pounds) you may make use of the first Table of *Practice* before mentioned (which shews the even parts of a shilling in pence) to finde what part of the price of one Pack of Wool, is to be taken for any number of Scores from 1 to 11, because 1 Pack of Wool contains so many Scores as there is pence in a shilling, which is 12.

If you finde any odd  $\text{lb}$ , take such parts of the price of one score, as the second Table of *Practice* sheweth, because one score is so many pounds, as there is shillings in 1 ℒ sterling, which is 20, as the following example will shew.

Pack

| Pack                           | £    | β  | Packs | Scores     |
|--------------------------------|------|----|-------|------------|
| 1                              | 12   | 10 | 11    | 6          |
|                                |      |    | 12    | 10 β       |
|                                |      |    | 22    |            |
|                                |      |    | 11    |            |
| 10 β is $\frac{1}{2}$ of 1     | £    | 5  | 10    |            |
| 6 Scores is $\frac{1}{2}$ of 1 | Pack | 6  | 5     |            |
|                                |      |    |       |            |
|                                |      |    | Facit | 143 — 15 β |

Having multiplied the 11 Packs by the price of 1 Pack, which is 12 £ 10 β. I consider what part of 1 Pack 6 Scores are. I finde that 6 Scores is a half pack, therefore I take the half of the price of 1 Pack, which is 6 £ 5 β, and adde it to the other sums; the total is 143 £ 15 β.

94. If 1 lb of Wool cost 10 q, what cost 6 Packs and 4 Scores? *facit* 63 £ 6 β 8 q.

95. *Item*, If 1 lb of Wool cost 9 q 2 q, what cost 8 Packs and 3 Scores? *facit* 78 £ 7 β 6 q.

96. *Item*, What cost 10 Packs 10 Scores of Wool at 13 q 1 q the lb? *facit* 143 £ 10 β 10 q.

|      |               |         |       |           |
|------|---------------|---------|-------|-----------|
| Pack | $\mathcal{L}$ | $\beta$ | Packs | Scores.   |
| 1    | 13            | 5       | 10    | 10        |
|      |               |         | 13    | 5 $\beta$ |

130

5  $\beta$  is  $\frac{1}{4}$  of 1  $\mathcal{L}$  ———— 2 ——— 10 — 0

6 Scores is  $\frac{1}{2}$  Pack ———— 6 ——— 12 — 6

4 Scores is  $\frac{1}{3}$  of 1 Pack ———— 4 ——— 8 — 4

Facit 143 ——— 10 — 10

97. Item, What cost 4 Packs 9 Scores at 14  $\mathcal{Q}$  3  $\mathcal{Q}$  the pound? facit 70  $\mathcal{L}$  1  $\beta$  3  $\mathcal{Q}$ .

98. Item, What cost 5 Packs 1 Score and 15  $\text{lb}$ , if 1  $\text{lb}$  cost 8  $\mathcal{Q}$ ? facit 41  $\mathcal{L}$  3  $\beta$  4  $\mathcal{Q}$ .

|      |               |       |       |             |
|------|---------------|-------|-------|-------------|
| Pack | $\mathcal{L}$ | Packs | Score | $\text{lb}$ |
| 1    | 8             | 5     | 1     | 15          |
|      |               | 8     |       |             |

40

1 Score is  $\frac{1}{12}$  of 1 Pack 0 ——— 13 — 4

10  $\text{lb}$  is  $\frac{1}{2}$  Score ——— 0 ——— 6 — 8

5  $\text{lb}$  is  $\frac{1}{4}$  of 10  $\text{lb}$  ——— 0 ——— 3 — 4

Facit 41 ——— 3 — 4

X

Other-

Otherwise.

| Pack | ℒ | Packs | Score | ℥  |
|------|---|-------|-------|----|
| 1    | 8 | 5     | 1     | 15 |
|      |   | 8     |       |    |

40

1 Score at 8 ℥ is 40 Groats or — 0 — 13 — 4

15 ℥ is worth 30 Groats or — 0 — 10 — 0

Facit 41 — 3 — 4

99. *Item*, What cost 9 Packs 5 Scores and 5 ℥ at 11 ℥ the pound? *facit* 103 ℒ 16 ℥ 3 ℥.

100. *Item*, A Tradesman bought 4 parcels of Wool, to wit, 8 Packs 4 Scores and 12 ℥, 9 Packs 2 Scores and 16 ℥, 5 Packs 8 Scores and 8 ℥, and 6 Packs 2 Scores and 10 ℥, at 9 ℒ 12 ℥ the Pack; what amounts the whole? *facit* 283 ℒ 8 ℥ 9 ℥.

Pack

| Packs | Scores | lb |
|-------|--------|----|
| 8     | — 4 —  | 12 |
| 9     | — 2 —  | 16 |
| 5     | — 8 —  | 8  |
| 6     | — 2 —  | 10 |

| Pack | L     | β    |            |
|------|-------|------|------------|
| 1    | — 9 — | 12 — | 29 — 6 — 6 |
|      |       |      | 9 — 12     |

261

|  |           |      |      |   |
|--|-----------|------|------|---|
| 10 β is $\frac{1}{2}$ L                            | — — — — — | 14 — | 10 — | 0 |
| 2 β is $\frac{1}{10}$ L                            | — — — — — | 2 —  | 18 — | 0 |
| 6 Scores is $\frac{1}{2}$ Pack                     | — — — — — | 4 —  | 16 — | 0 |
| Suppose 1 Score which is $\frac{1}{2}$ of 6 Scores | — — — — — | 0 —  | 16 — | 0 |
| 5 ℔ is $\frac{1}{4}$ of 1 Score                    | — — — — — | 0 —  | 4 —  | 0 |
| 1 ℔ is $\frac{1}{5}$ of 5 ℔                        | — — — — — | 0 —  | 0 —  | 9 |

Facit 183 — 8 — 9 $\frac{1}{2}$

101. Item, A Tradesman bought 6 parcels of Wool, weighing as followeth. 3 Packs 3 Scores 9 ℔, 4 Packs 5 Scores 16 ℔, 2 Packs 11 Scores 0 ℔, 1 Pack 8 Scores and 12 ℔, 2 Packs 5 Scores 15 ℔, and 2 Packs, 0 Scores and 2 ℔ at 8 s 2 q the pound; what must he pay in all? facit 143 L 11 β 7 s.



# An Appendix.

A Table of Practice, shewing the even Parts  
of a Pound of Wool in Pounds, or the even  
Parts of a Quarter of a Hundred weight  
in Pounds, being both 28 Pounds.

|     |    |   |
|-----|----|---|
|     |    | $\frac{1}{2}$ or $\frac{1}{4}$ and $\frac{1}{7}$ of it is the sum.                      |
|     |    | $\frac{1}{4}$ or $\frac{1}{2}$ and $\frac{1}{7}$ of it is the sum.                      |
|     |    | 2: and 1, 2 is $\frac{1}{4}$ and 1 is $\frac{1}{2}$<br>of 2 ℔.                          |
|     | 4  | $\frac{1}{7}$   |
|     | 5  | 4 and 1, 4 is $\frac{1}{7}$ and 1 is $\frac{1}{4}$ of<br>4 ℔.                           |
|     | 6  | 4 and 2, 4 is $\frac{1}{7}$ and 2 is $\frac{1}{2}$ of<br>4 ℔.                           |
|     | 7  | $\frac{1}{4}$   |
|     | 8  | $\frac{1}{7}$ twice or $\frac{2}{7}$ .  |
|     | 9  | 7 and 2, 7 is $\frac{1}{4}$ and 2 is $\frac{1}{4}$ , or<br>$\frac{2}{7}$ of 7 ℔.        |
| For | 10 | Take 4: 4 and 2, 8 is $\frac{2}{7}$ and 2 is $\frac{1}{2}$ of<br>4 ℔.                   |
|     | 11 | 7 and 4, 7 is $\frac{1}{4}$ and 4 is $\frac{1}{7}$ .                                    |
|     | 12 | $\frac{1}{7}$ thrice or $\frac{3}{7}$ .   |
|     | 13 | 7: 4 and 2, 7 is $\frac{1}{4}$ , 4 is $\frac{1}{7}$ , and<br>2 is $\frac{1}{2}$ of 4 ℔. |
|     | 14 | $\frac{1}{2}$   |
|     | 15 | 14 and 1, 14 is $\frac{1}{2}$ and 1 is $\frac{1}{14}$<br>of 14 ℔.                       |
|     | 16 | 14 and 2, 14 is $\frac{1}{2}$ and 2 is $\frac{1}{7}$<br>of 14 ℔.                        |

For

# An Appendix.

| lb       |        |  |
|----------|--------|--|
| 17       |        | 14: 2 and 1, 14 is $\frac{1}{2}$ , 2 is $\frac{1}{7}$ of 14, and 1 is $\frac{1}{2}$ of 2 $\text{℥}$ .                    |
| 18       |        | 14 and 4, 14 is $\frac{1}{2}$ and 4 is $\frac{1}{7}$ .   |
| 19       |        | 14: 4 and 1, 14 is $\frac{1}{2}$ , 4 is $\frac{1}{7}$ , and 1 is $\frac{1}{4}$ of 4 $\text{℥}$ .                         |
| 20       |        | 14: 4 and 2, 14 is $\frac{1}{2}$ , 4 is $\frac{1}{7}$ , and 2 is $\frac{1}{2}$ of 4 $\text{℥}$ .                         |
| 21       |        | 14 and 7, 14 is $\frac{1}{2}$ and 7 is $\frac{1}{2}$ .   |
| 22       |        | 14: 7 and 1, 14 is $\frac{1}{2}$ , 7 is $\frac{1}{2}$ , and 1 is $\frac{1}{7}$ of 7 $\text{℥}$ .                         |
| For { 23 | Take { | 14: 7 and 2, 14 is $\frac{1}{2}$ , 7 is $\frac{1}{2}$ , and 2 is $\frac{1}{7}$ of 14 $\text{℥}$ .                        |
| 24       |        | 14: 7: 2 and 1, 14 is $\frac{1}{2}$ , 7 is $\frac{1}{2}$ , 2 is $\frac{1}{7}$ , and 1 is $\frac{1}{4}$ of 2 $\text{℥}$ . |
| 25       |        | 14: 7: and 4, 14 is $\frac{1}{2}$ , 7 is $\frac{1}{2}$ , and 4 is $\frac{1}{7}$ .  |
| 26       |        | 14: 7: 4 and 1, 14 is $\frac{1}{2}$ , 7 is $\frac{1}{2}$ , 4 is $\frac{1}{7}$ , and 1 is $\frac{1}{4}$ of 4 $\text{℥}$ . |
| 27       |        | 14: 7: 4 and 2, 14 is $\frac{1}{2}$ , 7 is $\frac{1}{2}$ , 4 is $\frac{1}{7}$ , and 2 is $\frac{1}{2}$ of 4 $\text{℥}$ . |

102. If 1 Tod of Wool (or 28  $\text{℥}$ ) cost 16  $\text{β}$  4  $\text{q}$ , what cost 12 Tods and 7  $\text{℥}$ ? *facit* 10  $\text{ℓ}$  0  $\text{β}$  1  $\text{q}$ .

X 3

Tod

*An Appendix.*

|     |   |    |   |      |    |
|-----|---|----|---|------|----|
| Tod | β | g  |   | Tods | th |
| 1   | — | 16 | — | 12   | —  |
|     |   | 4  |   |      | 7  |

|    |    |                        |     |   |   |   |   |   |   |   |     |
|----|----|------------------------|-----|---|---|---|---|---|---|---|-----|
| 10 | β  | is $\frac{1}{2}$ of 1  | ℒ   | — | — | — | — | — | 6 | — | 0   |
| 5  | β  | is $\frac{1}{2}$ of 10 | β   | — | — | — | — | — | 3 | — | 0   |
| 1  | β  | is $\frac{1}{5}$ of 5  | β   | — | — | — | — | — | 0 | — | 12  |
| 4  | g  | is $\frac{1}{4}$ of 1  | β   | — | — | — | — | — | 0 | — | 4   |
| 7  | th | is $\frac{1}{7}$ of 1  | Tod | — | — | — | — | — | 0 | — | 4—1 |

Facit 10—0—1

103. *Item*, What cost 13 Tods 14 th at 18 β 8 g the Tod? facit 12 ℒ 12 β 0 g.

104. *Item*, What cost 24 Tods 18 th of Wool, at 22 β 7 g the Tod? facit 27 ℒ 16 β 6 g 0 $\frac{1}{4}$  g.

|     |   |   |   |      |          |
|-----|---|---|---|------|----------|
| Tod | ℒ | β | g | Tods | th       |
| 1   | — | 1 | — | 24   | —        |
|     |   | 2 | — |      | 18       |
|     |   | 7 |   |      | 1—2—7 g. |

|    |    |                        |     |   |   |      |
|----|----|------------------------|-----|---|---|------|
|    |    |                        |     |   |   | 24—0 |
| 2  | β  | is $\frac{1}{2}$ of 1  | ℒ   | — | — | —    |
| 6  | g  | is $\frac{1}{6}$ of 2  | β   | — | — | —    |
| 1  | g  | is $\frac{1}{6}$ of 6  | g   | — | — | —    |
| 14 | th | is $\frac{1}{14}$ of 1 | Tod | — | — | —    |
| 4  | th | is $\frac{1}{4}$ of 1  | Tod | — | — | —    |

Facit 27—16—6—0 $\frac{1}{4}$ 

105. *Item*, What cost 26 Tods 20 th of Wool at 23 β 4 g the Tod? facit 31 ℒ 3 β 4 g.

106. *Item*,

106. *Item*, What cost 32 Stones and 7  $\ell$  of Wool at 13  $\beta$  0  $\mathcal{G}$  the Stone? *facit* 21  $\mathcal{L}$  2  $\beta$  6  $\mathcal{G}$ .

*Note*, 1 Stone is a half Tod or 14  $\ell$ .

|       |         |               |        |             |
|-------|---------|---------------|--------|-------------|
| Stone | $\beta$ | $\mathcal{G}$ | Stones | $\text{lb}$ |
| 1     | 13      | 0             | 32     | 7           |

10  $\beta$  is  $\frac{1}{2}$  of 1  $\mathcal{L}$  --- 16 --- 0-0

2  $\beta$  is  $\frac{1}{10}$  of 1  $\mathcal{L}$  --- 3 --- 4-0

1  $\beta$  is  $\frac{1}{2}$  of 2  $\beta$  --- 1 --- 12-0

7  $\ell$  is  $\frac{1}{2}$  of 1 Stone --- 0 --- 6-6

*Facit* 21 --- 2-6

107. *Item*, If 1 Stone of Wool cost 11  $\beta$  4  $\mathcal{G}$  2  $\mathcal{Q}$ , what cost 48 Stones 9  $\ell$ ? *facit* 27  $\mathcal{L}$  13  $\beta$  3  $\mathcal{G}$  3  $\mathcal{Q}$ .

*Note*, To know briefly what the Hundred weight (great and small) or the Wey of Cheefe, cost at a certain price the Pound, observe the Three Rules following.

1. *For the Great Hundred or 112  $\text{lb}$ .*

For every Farthing that 1 Pound is worth, reckon so many times 2 Shillings and 1 Groat, (because 112  $\mathcal{Q}$  is 2  $\beta$  4  $\mathcal{G}$ ) what comes out, is the price of the Hundred, as followeth.

X 4

2  $\mathcal{G}$

*An Appendix.*

2  $\text{q}$  1  $\text{q}$  is 9  $\text{q}$ . Now twice 9  $\beta$  is — 18  $\beta$   
 And once 9 Groats is 3  $\beta$

*Facit* 21  $\beta$ , the  
 price of 1 C  
 at 2  $\text{q}$  1  $\text{q}$   
 the Pound.

108. *Item*, What cost 1 C (or 112  $\text{ss}$ ) if  
 1  $\text{ss}$  cost 7  $\text{q}$  3  $\text{q}$ ? *facit* 3  $\text{L}$  12  $\beta$  4  $\text{q}$ .

7  $\text{q}$  3  $\text{q}$  is 31  $\text{q}$ . Twice 31  $\beta$  is — 62  $\beta$   
 Once 31 Gro. is 10  $\beta$  4  $\text{q}$

7 1/2  $\beta$  4  $\text{q}$

*Facit* 3  $\text{L}$  12  $\beta$  4  $\text{q}$

109. *Item*, What cost 1 C at 4  $\text{q}$  2  $\text{q}$  the  
 Pound? *facit* 42  $\beta$ .

2. *For the small Hundred or 100 lb.*

For every Farthing that 1 Pound cost, reckon  
 so many times 2  $\beta$  1  $\text{q}$  (because 100  $\text{q}$  is 2  $\beta$   
 1  $\text{q}$ ) what comes out, is the price of 100  $\text{ss}$  or  
 5 Scores, as followeth.

110. *Item*, If 1  $\text{ss}$  cost 3  $\text{q}$  2  $\text{q}$ , what cost a  
 Hundred or 5 Scores? *facit* 29  $\beta$  2  $\text{q}$ .

3  $\text{q}$  2  $\text{q}$  is 14  $\text{q}$ . Now twice 14  $\beta$  is — 28  $\beta$   
 And once 14  $\text{q}$  is — 1 — 2  $\text{q}$

*Facit* 29 — 2  $\text{q}$

111. *Item*,



111. *Item*, What cost a small Hundred weight, if 1  $\text{℥}$  cost 8  $\text{d}$  1  $\text{q}$ ? *facit* 3  $\text{L}$  8  $\text{β}$  9  $\text{d}$ .

8  $\text{d}$  1  $\text{q}$  is 33  $\text{q}$ . Now twice 33  $\text{β}$  is 66  $\text{β}$   
And once 33  $\text{d}$  is ---2-9  $\text{d}$

---

68-9  $\text{d}$

---

*Facit* 3  $\text{L}$  8  $\text{β}$  9  $\text{d}$

112. *Item*, What cost 100  $\text{℥}$ , if 1  $\text{℥}$  cost 5  $\text{d}$  3  $\text{q}$ ? *facit* 47  $\text{β}$  11  $\text{d}$ .

3. *For the Wey of Cheese or 256  $\text{lb}$ .*

For every Farthing that 1 Pound cost, reckon so many Crowns, and so many Groats (because 256  $\text{q}$  is 5  $\text{β}$  4  $\text{d}$ ) what comes out, is the price of 1 Wey, as followeth.

113. *Item*, If 1 Pound of Cheese cost 2  $\text{d}$  3  $\text{q}$ , what cost 1 Wey or 256  $\text{℥}$ ? *facit* 2  $\text{L}$  18  $\text{β}$  8  $\text{d}$ .

2  $\text{d}$  3  $\text{q}$  is 11  $\text{q}$ . Now 11 Crowns is 2  $\text{L}$  15  $\text{β}$   
And 11 Groats is ---3-8  $\text{d}$

---

*Facit* 2 --- 18--8  $\text{d}$

---

114. *Item*, If 1 Pound of Cheese cost 3  $\text{d}$  2  $\text{q}$ , what cost 1 Wey? *facit* 3  $\text{L}$  14  $\text{β}$  8  $\text{d}$ .

115. *Item*, If 6 Yards cost 26  $\text{β}$  6  $\text{d}$ , what cost 1 Yard? *facit* 4  $\text{β}$  5  $\text{d}$ .

Yards

## An Appendix.

|       |      |     |      |
|-------|------|-----|------|
| Yards | β    | q   | Yard |
| 6     | — 26 | — 6 | — 1  |

6) —————

Facit 4 — 5 q

116. Item, What cost 1 Yard, if 9 Yards cost 29 β 3 q? *facit* 3 β 3 q.

117. Item, If 36 ~~ℓ~~ cost 83 L 2 β, what cost 1 ~~ℓ~~? *facit* 2 L 6 β 2 q.

|    |      |     |     |
|----|------|-----|-----|
| ℔  | L    | β   | ℔   |
| 36 | — 83 | — 2 | — 1 |

6) —————

13 — 17 — 0

6) —————

Facit 2 — 6 — 2 q

118. Item, If 48 ~~ℓ~~ cost 80 L, what cost 1 Pound? *facit* 1 L 13 β 4 q.

119. Item, What cost 35  $\frac{1}{4}$  Ells at 5 β 9 q 2 q the Ell? *facit* 10 L 4 β 1 q 3  $\frac{1}{4}$  q.

|     |   |   |      |
|-----|---|---|------|
| Ell | β | q | Ells |
|-----|---|---|------|

1 — 5 — 9 — 2 — 35  $\frac{1}{4}$ 

————— (7

2 — 0 — 6 — 2

————— (5

10 — 2 — 8 — 2

 $\frac{1}{4}$  of 1 Ell is 0 — 1 — 5 — 1  $\frac{1}{4}$  or  $\frac{1}{2}$  q

—————

Facit 10 — 4 — 1 — 3  $\frac{1}{4}$ 

120. Item, What cost 32 Yards and 2 Quarters at 2 L 13 β 6 q 2 q the Yard? *facit* 87 L 0 β 1 q 1 q.

121. Item,

# An Appendix.

311

121. *Item*, If 4 Yards cost 3 £ 12 β 2 q,  
what cost 9 Yards? *facit* 8 £ 2 β 4 q 2 q.

Yards £ β q Yards.

4 — 3 — 12 — 2 — 9  
— — — — — (9

32 --- 09 --- 6

4) — — — — —

*Facit* 8 --- 02 --- 4 --- 2 q

*Otherwise.*

Yards £ β q Yards.

4 — 3 — 12 — 2 — 9

4) — — — — —

0 --- 18 --- 0 --- 2

— — — — — (9

*Facit* 8 --- 02 --- 4 --- 2

122. *Item*, If 3 ℔ cost 2 £ 11 β 3 q,  
what cost 7 Pound? *facit* 5 £ 19 β 7 q.

123. *Item*, If 12 ℔ cost 4 £ 13 β 4 q,  
what cost 18 Pound? *facit* 7 £.

124. *Item*, What cost 10 ℔, if 3 ounces  
cost 4 β 9 q? *facit* 12 £ 13 β 4 q.

*Note*, What is here found wanting of this  
*Rule* in this short *Appendix*, will be in the *Second*  
*Part*.

F I N I S.

READER,

# READER,

**T**HAT every man (none excepted) is subject to mistake, is an undeniable truth: Therefore I hope thou wilt excuse the few mistakes which are escaped in the Press. It is a rare thing to see Books of this nature to be wholly free from faults, especially when the Author cannot attend the Press: If thou findest more then are hereunder mentioned, they are such (I hope) as will not cause material Errors; nevertheless thou art desired to correct both small and great, patiently with thy Pen.

**F**OL. 41. Line 10. instead of for every Quarter, Read every four Quarters. Fol. 62. In the direction of the 16 Question, instead of the rest will be 109, read the rest will be 108. Fol. 75. In line 2. of the Answer of the 15 Question, instead of other gures, read other figures. Fol. 80. In the 41 Question, instead of what yo you, read what do you. Fol. 132. The Dividend of the Division is 88218, but read 88215 instead thereof. Fol. 225. In the 29 Question, instead of 16 £ 18 s, read 16 £ 8 s. Fol. 229. In the 82 Question, instead of 3 £ 10 s 4 d, read 3 £ 19 s 4 d. Fol. 244. In the 26 Question, for The Rule of the Three direct, read The Rule of Three direct. Fol. 295. In the 70 Question, for 24 s 9 d, read 24 s 6 d.

The Folio's 285, 286, 287, and 288, are set twice over.



*An Advertisement.*

**T**He *Author* of this Book,  
hath another small Book  
in the Press, containing sun-  
dry *Tables*, (*viz.* for the ready  
summing up the Price of  
*Colchester Bays, &c.*) very  
useful for *Merchants* and  
*Tradesmen*.





31-73  
3 02

3 14 5

29 84

30 86

11 00

51 36

1hn

7 45  
32

raygood

3 50

65

115

John Gray  
yours  
Wm. B. Cook